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Government
Publications

1965 RESEARCH INDEX

Ottawa
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Projects being carried on
within Ontario Government
Departments and Agencies in:

AGRICULTURE
ARCHITECTURE
CHEMISTRY
EARTH SCIENCES
ENGINEERING
FORESTRY
LIFE SCIENCES
PHYSICS

Published by the Ontario Economic Council

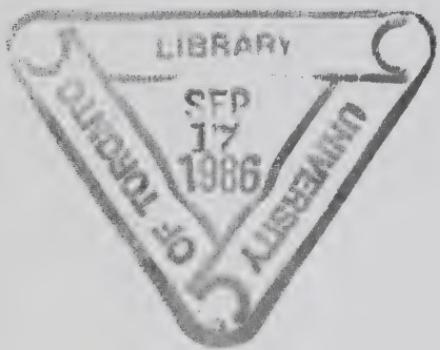
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1965 RESEARCH INDEX

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FOREWORD

This is an index of research projects being undertaken in mid-1965 within Ontario Government Departments and by several specialized agencies which report to the Government.

It has two primary purposes.

First, the growing technological complexity of our industrial activities, from agriculture to manufacturing, make it desirable to facilitate communication between those engaged in research and those who can put their findings into practical economic form. The index, therefore, lists the principal investigators of each project so that sources of detailed information can be more readily available to interested persons.

Second, the rapid expansion of research activities in universities, in government laboratories, and in industry has made it difficult to follow what is being done in any one field. The National Research Council, Ottawa, is currently preparing a similar index of research conducted in Canadian universities. This index, in conjunction with that of the National Research Council, will, it is hoped, assist those responsible for decisions regarding research policy and funding to discover which areas of research are being actively investigated and where there may be gaps.

It will be noted that the index does not attempt to include all areas of research but has been restricted initially to the types of investigation which may be of interest to the industrial sector. For this first edition, industry has not been asked to contribute a listing of privately financed projects since the majority of these could be of proprietary interest to the company. To be useful, the index should be revised annually and it is hoped that future editions may contain such generalized descriptions of research activities as industrial research laboratories care to provide.

The Ontario Economic Council wishes to acknowledge the excellent

co-operation received from all Departments and Agencies concerned in compiling this index and the editorial direction of Dr. A. D. Misener, M.A., Ph.D., F.R.S.C., M.E.I.C. of the University of Toronto. We will welcome any suggestions for revision or expansion.

W. H. CRANSTON,
Chairman.

November, 1965.

CONTENTS

	Page
Foreword	3, 4
Index of Departments and Agencies	7, 8
Index of Principal Investigators	9-12
Subject Index	13-21
 Directory of Projects	
 AGRICULTURE	
Projects 1-136.....	25-32
 ARCHITECTURE	
Projects 137, 138.....	35
 CHEMISTRY	
Projects 139-176.....	39-42
 EARTH SCIENCES	
Projects 177-185.....	45, 46
 ENGINEERING	
Projects 186-353.....	49-59
 FORESTRY	
Projects 354-368.....	63, 64
 LIFE SCIENCES	
Projects 369-444.....	67-73
 PHYSICS	
Projects 445-466.....	77, 78

INDEX OF DEPARTMENTS AND AGENCIES

Department of Agriculture

- Horticultural Experimental Stations (Vineland) 120-126
- Horticultural Products Laboratory (Vineland) 127-134
- Kemptville Agricultural School 1-12
- MacDonald Institute (Guelph) 139, 445-447
- Ontario Demonstration Farm (New Liskeard) 119
- Western Ontario Agricultural School & Experimental Farm (Ridgetown) 13-118, 369-373

Department of the Attorney General

- Attorney's General Laboratory 140-146, 177, 374, 375, 448-454
- Office of the Fire Marshall 186

Department of Education

- Division of School Planning & Building Research 137, 187

Department of Energy Resources and Management

- Conservation Authorities Branch 178-180, 354, 376
- Energy Branch 181

Department of Highways

- Materials and Testing Division 211-231
- Research Section 194-210
- Road Design Division 188-190
- Traffic and Planning Studies Section 191-193

Department of Lands and Forests

- Research Branch 355-366, 377-381
- Research Branch—Mechanics Section 367
- Research Branch—Mensuration and Statistics Section 368
- Research Branch—Fisheries 382-430

Department of Mines

- Mines Inspection Branch 336

Department of Transport

138

Hydro Electric Power Commission of Ontario

Research Division 136, 172-176, 182, 232-335, 455-460

Ontario Research Foundation

Department of Applied Microbiology 432-434

Department of Engineering and Metallurgy 338-344, 466

Department of Industrial Biochemistry 162, 163

Department of Materials Chemistry 147-155, 461

Department of Organic Chemistry 156-161, 337, 431

Department of Parasitology 435-441

Department of Physical Chemistry 164-169

Department of Physics 462-465

Department of Physiography 135, 183, 184

Department of Textile Research 170, 171

Ontario Water Resources Commission

Research Division 185, 345-353, 442-444

INDEX OF PRINCIPAL INVESTIGATORS

This list is compiled in accordance with the returns submitted by the various research groups. The names appearing here are those to whom further enquiries regarding specific projects should be addressed. It will be noted that there is a great variation in the listing of associated research personnel in the body of the index. This probably reflects the variation of practice within the different departments and agencies. The editors have not attempted to impose any arbitrary criteria in this matter though they feel that some uniformity would be desirable in the future.

Adams, A. M.	127, 128
Adams, J. I.	182, 232-240
Amiro, G. T.	186
Anderson, E. J.	448
Anderson, R. C.	435
Archibald, J. A.	120-123
Armstrong, W. N. B.	147-155, 461
Baker, M. H.	367
Baldwin, C. S.	13-22
Beach, M. E.	1, 2
Beckwith, A.	368
Bennett, G. F.	436
Berst, A.	382-384
Brohier, G.	140
Brown, D. M.	135, 183
Brown, R.	23-46
Burnett, K. A.	3, 5
Butler, J. D.	119
Cameron, A. W. W.	241-262
Campbell, L. A.	432-434
Carmichael, A. J.	355
Cassan, J. G.	263-275, 455
Cavanagh, R. L.	338-344, 466
Chapman, L. J.	184

Chojnacki, B.	194–196, 211
Chong, G.	197, 198
Christie, W. J.	385–391
Clair, E. G.	141
Clendenning, T. G.	276–285
Coble, D.	392–394
Corkill, J.	212, 213
Crowther, R. F.	129
Cucin, D.	395
Curtis, J. D.	47–57
Dechtiarenko, A.	396, 397
Duggal, A. N.	199
Dunikowska, Z.	200
Faber, D.	398
Fallis, A. M.	437, 438
Fan, M. C.	142, 143
Farren, D. W.	188–190
Ferguson, R. G.	399–403
Fitzgerald, G. W. N.	286
Forster, J. L.	191
Fowler, D. P.	356
Francis, T.	164
Frank, R.	58–79
Fraser, J. M.	404–411
Freeman, R. S.	439
Frenkel, O. J.	177
Fromm, H. J.	201–203
Funk, H. J.	144, 374
Fylie, A.	377
Goodings, A. C.	170, 171
Gordon, A. G.	357
Gryniowski, P.	178
Gupta, R. C.	145
Haddow, W. R.	358
Hall, A. E. D.	146
Harmelink, M. D.	204, 205
Harris, A. J.	185, 345–353, 442–444

Harrison, D.	287, 288
Harvie, P.	354
Henry, W. C.	162, 163
Hepburn, R. L.	378
Hills, G. A.	359
Hogg, A. D.	289–296, 455–457
Holowacz, J.	360
Irvine, O. R.	4, 5
Jacobsen, R. C.	297, 298
Johnston, G. H.	192
Jones, M. H.	165, 166
Kerr, E. A.	124–126
Kolenosky, G.	379
Krcma, V.	449–452
Larsson, H. C.	361
Latornell, A.	179
Leslie, A.	206
Leslie, J. R.	299–311
Lo, K. Y.	214–218
Luckham, D. G.	80–92
Lumsden, H. G.	380
Lyon, F.	362
MacDonald, J. A.	93, 369–373
MacLeod, J. C.	412–415
Maher, F. P.	416–418
Martin, N. V.	419–421
Mayall, K.	376
McAdie, H. G.	167, 168
McCombie, A. M.	422–424
McEwen, J. K.	363
McLaren, A. D.	94–106
McLean, M. M.	364
Mullin, R. E.	365
Murray, J. W.	180
Nichol, R. C.	453
Nicol, F. J. K.	137, 187

Perkins, A. K.	375
Phang, B.	219
Phang, W.	220, 221
Reid, S. G.	156–161, 337, 431
Richards, H. R.	139, 445–447
Ryell, J.	222, 223
Ryder, R. A.	425–430
Schonfeld, R.	207
Schumacher, B. W.	462–465
Sefton, V. B.	169
Sharp, D. A.	181
Shelson, W.	312
Simpson, F. J.	313–322
Sinclair, G. A.	366
Skepasts, A. V.	6–9
Smith, P.	224–229
Smith, R. L.	336
Stephenson, A. B.	381
Stevenson, C. K.	107–112
Stinson, F. A.	10–12
Suggitt, J. W.	136, 172–176, 323–332, 458, 459
Suter, A. C.	230
Sutherland, W. W.	454
Svaton, J.	368
Syer, M.	130
Tamberg, K. G.	208, 209
True, J. S.	193
Truscott, J. H. L.	131, 132
Vanderleck, J. M.	333–335, 460
Vincent, P. T.	231
Wade, P. E.	138
Wallace, J. M.	113–117
Winfield, R. G.	118
Wolfe, R. I.	210
Wright, K.	440, 441
Zubeckis, E.	133, 134

SUBJECT INDEX

The principal investigators were asked to classify each of their projects under one or two titles selected from a list of "fields of investigation". These general classifications will be found below (e.g. Analytical Chemistry, Electrical Engineering, Parasitology) together with a listing of projects under descriptive words also supplied by the investigators (e.g. Herbicides, Polymers, Power Transmission, Pavements). In addition the editors have selected certain key words from the detailed description of the projects which specify the object or material on which the research is being done (e.g. corn, concrete, iron, paper, sweet-potatoes, etc.).

By arranging these three categories of description in one alphabetical list, the subject index becomes a convenient cross reference. Each project will appear under at least three headings, sometimes more (for example, Project #111 appears under the headings of Agronomy, Soil Fertility, Hay, Oats, Corn and Soybeans). The range of work in a particular science is illustrated by the number of projects appearing under its general title. Under Agronomy there are 63 projects, under Geochemistry 1 project, and under Test Methods and Measurements (also listed as Measurements and Test Methods) there are 29 projects.

No attempt has been made to modify the individual preferences as to subject titles appropriate to a project so it has been sometimes necessary to use several listings to cover an entire field of investigation, for example anyone interested in the general field of paving materials should consult the projects listed under Asphalt, Cement, Pavement as well as Test Methods and Measurements.

- Adhesives 328
- Absorbents 167
- Agricultural Chemistry 136, 172, 173
- Agricultural Engineering 93, 118, 136
- Agronomy 6-13, 36, 42-58, 64-79, 94-106, 111-117, 135
- Alfalfa 95, 99
- Algae 442-444
- Alkaloids 145

- Analysis—pharmaceutical 142, 143, 146
Analysis—tiny samples 141
Analytical Chemistry 141, 143–147, 162, 169
Animal Husbandry 1–5, 93, 118, 119
Apple 126
Apricot 126
Architecture 137
Asbestos 147
Asparagus 26
Asphalt and asphaltic concrete 203, 212, 219, 220, 221
Atomic and molecular physics 162
- Bacteria 2, 128, 433
Barley 6, 47, 50
Bass (smallmouth) 393, 412–415
Beans (see also snapbeans, soybeans, lima beans, white beans) 36, 75, 104, 106
Bear (black and polar) 379
Beaver 381
Beef cattle 119
Beets (see sugar-beets) 13, 70–74, 101, 103
Biochemistry 158, 375
Biophysics 375
Birds 380, 436, 438
Bird's-foot Trefoil 94, 109
Black-fly 157, 437
Botany 23–27, 41, 58–79, 431
Bridges 208, 209, 213, 225
Bromegrass 97
Building materials and construction 150, 151, 155, 187, 231, 278
Butter 2
- Cables 241, 244, 246, 249, 269, 272, 297
Canning 132
Carbohydrates 160
Caribou 378
Carrots 41
Catalysts 167
Cattle 119, 369–373
Cavitation 315
Ceramics 149, 154

Cereals 6, 47–50, 55–58
Cement and concrete 151, 194–196, 211, 222–228, 276, 277, 279–285, 294
Charred documents 140
Cheese 4
Chemical Engineering 249, 287, 288, 297, 298, 323, 324, 330, 332
Chemical & physical properties 148, 154, 170, 174, 176, 177, 278, 292, 314, 320, 321, 337, 340, 341, 344, 355, 423, 428, 445–447, 459
Chemistry 140, 153, 154
Cherry 126
Chickens 80, 82, 83, 85–92
Chrysanthemum 124
Civil Engineering 182, 187–240, 276–285, 289, 291, 294, 325–328, 348
Clathrates 168
Clay (properties) 214, 216–218, 233, 234, 236, 238
Clematis 124
Climatology 183
Cold Storage 131
Computer applications 181, 257
Concrete (see Cement)
Corn 12, 14–19, 21, 22, 29, 30, 43–46, 76–79, 93, 102, 105, 107, 110, 111, 117, 125, 135, 369, 372
Corrosion and inhibitors 202, 231, 297, 317, 318, 322, 326
Coyote 379
Criminalistics 177
Crop Husbandry 6–12, 135
Crop Management—rotation and production practices 15, 17, 22, 52–57, 105, 106, 111, 113–117
Cucumber 31, 125
Currant 126

Dairy Science 1–5
Dams 237
Data transmission systems 299
Deer 378, 435
Detergents 413
Diffusion 185

Ecology (animal) 376–381, 427
 (plant) 135, 357, 361–366, 444
Eel (American) 388

- Eggs 85
Electrical and Electronics Engineering 241–275, 286, 299–311, 314, 331, 333–336, 455
Electromagnetic Waves & Electron Physics 447, 462–466
Electron Microscopy 464, 465
Emission Spectroscopy 141
Entomology 42–46, 157, 370, 437, 438
Environmental factors (growth) 121
Enzymes 433
- Fats 163
Fatty acids 162
Fertilizers 13–22, 108–110, 112, 123
Fibres 144, 170, 171, 337, 445, 447
Field Crops 42–46, 64–79
Fire prevention 186, 367
Fish and fisheries research 376, 382–430
Fish stocks and populations 390, 394, 397–404, 411, 416, 421, 429
Flavour 3, 4
Fluorides 169
Foamed plastics 166
Food chemistry 163
Food preservation 130–132
Food quality 2
Forage crops 10, 11, 93–100, 109
Forage legumes 10, 100
Forensic firearms identification 448–454
Forensic Toxicology 145
Forest diseases 358
Forest ecology 357, 361–366
Forest & range science 161, 354–368
Forest & research economics 360
Forest surveys and sites 354, 359, 368
Foundations 236, 291
Freezing 132
Fruit Chemistry 134
Fruit crops 120, 123, 126, 129
Fruit products 130–132
Fruit syrups, etc. 133
Furbearers 381

- Geese (Canada) 380
Generators (electrical) 243, 252, 254, 255, 261
Genetics (animal) 119
Germination 42, 433
Geochemistry 177
Geography 179
Geology 177, 181, 182, 184
Gladiolus 124
Glass 148, 154
Grape 126, 129
Grass 10, 100, 109, 111
Grayling (arctic) 430
Grouse (ruffed and prairie) 380
Growth-regulating chemicals 52, 53, 55–58, 120, 136, 172, 173
Growth studies (fish) 392
Gypsum 150, 278
- Hair 170
Hay 111, 369
Heating (electrical) 263, 270, 271, 273, 298, 309
Herbicides 23–37, 59–79
Highways (see pavement)
Highway Standards 188–190
Holly 124
Horticulture 23–41, 59–63, 120–134
Hydraulic Engineering 295–296
Hydrogenation 163
Hydrology and Hydrography 178, 180, 185
- Illumination 264
Immunology 374
Inclusion compounds 168
Infra-red spectra 162
Inorganic chemistry 147–151, 154, 155, 167
Insect attractants 157
Insecticides 42–46, 370, 442
Insulation (electrical) 242, 243, 246–249, 254, 262, 275, 287
Iron (and iron ore) 338, 340–343
Isocyanates 164
- Kokanee 391, 417

- Lactic starters 1
Lamprey 386
Legumes 10
Lightning and electrical surges 250–253, 256, 258, 259
Lily 124
Lima beans 35
Limestone 155
Limnology 422–424, 428, 429, 443
Lubricants 165, 288
- Materials storage and handling 3, 93, 118
Measurements and test methods 211, 232–234, 255, 260–262, 269, 275, 278, 282, 283, 286, 302, 309, 330, 332–336, 347, 368, 375, 458, 460–466
Mechanical Engineering 187, 274, 290–293, 295, 296, 313, 319–321, 328, 329, 367
Mechanics 236, 289, 290, 292, 293, 295, 296, 313, 314, 445, 448–457
Metallurgy and metallurgical engineering 297, 298, 314–318, 322, 338, 340–344
Metals fatigue 292, 313, 344
Meteorology 121, 183
Microbiology 127, 128, 432–434, 442
Micro-climate 121
Milk 3, 5
Minerals separation 340, 343
Molecular sieves 167
Moose 378, 435
Muskeg 235
- Nematodes 440, 441
Nutrition {animal} 80–92, 369, 371–373, 378–381
 {plant } 123
- Oats 6, 49, 56, 57, 111, 114
Oils 7, 163, 176, 287, 288
Onions 27, 28
Operations Research 312
Optics 461
Orchard grass 98
Ore concentration 340, 342, 343
Organic chemistry 142, 152, 156–160, 164, 166, 171, 174, 176, 287, 288
Ornamental plants 123, 124

- Otter 381
Oxidation chemistry 152
Ozone 434
Paint 153, 461
Paper 159, 161, 337
Parasitology 377, 396, 397, 435–441
Pathology 377, 435, 438
Pavement 196–198, 200, 201, 203, 206, 207, 211, 212, 219–221, 224, 226, 228, 229
Pavement marking 230
Pavement sealing 194, 195
Peach 126
Pear 126
Peppers 125
Perch {white} 387
{yellow} 392
Pesticide chemistry 158
Petroleum geology 181
Pharmacy and pharmacology 145
Physical and chemical properties 148, 154, 170, 174, 176, 177, 278, 292, 314, 320, 321, 337, 340, 341, 344, 355, 423, 428, 445–447, 459
Physical chemistry 168
Piles 215, 218, 238, 297
Plankton 422
Plant breeding 124–126
Plant morphology 431
Plant physiology 120–122, 442
Plaster 278
Plastics 166, 325, 327, 329, 331, 332
Plum 126
Pollution (atmospheric) 169
Polymerization 139, 165
Potato 24, 25, 38, 125
Poultry science 80–92
Power (electrical) Distribution 241, 245, 253, 267
Systems 251, 257, 259, 266, 289, 300, 301, 305, 307, 310, 311, 312, 455, 457
Transmission 244, 250, 252, 255, 256, 258, 265, 267–269, 272, 274, 303, 304, 306, 308, 456
Predators and predation 378, 379, 381

- Preservatives 323, 324
Probability and statistics 312, 368
Radiation measurement 462, 463
Resins 159, 176
Rhododendron 124
Rope 321, 336
Salmon 391, 417
Sanitary engineering 345–353
Selective breeding (fish) 384
Sewage 185, 345, 346, 349, 351–353, 432–434
Silicon 156
Smelt 396, 399–401
Snapbeans 32–34
Soil fertility 13–22, 108–112, 123
Soil science 13–22, 107–112, 123, 177, 179, 359
Soil mechanics 214–218, 232, 236, 240
Sorghum 64, 96
Soybeans 8, 19, 51–54, 65–69, 107, 108, 111, 112, 116
Splake (hybrid trout) 382, 383, 418
Spoilage Bacteria 128
Stability (physical) 319
Strawberry 23, 126
Strength of materials 320
Stress analysis 293
Suckers 392, 409
Sudan 96
Sugar-beets 13, 70–74, 101, 103
Sunflower 7
Surface preparation 330
Sweet potato 125
Test methods and measurements 211, 232–234, 255, 260–262, 269, 275, 278, 282, 283, 286, 302, 309, 330, 332–336, 347, 368, 375, 458, 460–466
Textiles 170–171, 175, 446
Thermal properties 147, 274, 458–460
Timothy 109
Tomato 37, 39, 40, 59–63, 125
Toxicity 145, 316, 407, 434
Traffic control 191–193, 199, 204, 205, 210, 230

Transformers (electric) 252, 255, 258, 334
Transportation planning 138
Tree breeding 356
Trefoil 94, 109
Trout (brook) 404–410, 439
Trout (hybrid) 382, 383, 418
Trout (lake) 386, 419–421
Turbines 295, 296
Turkeys 80, 81, 84, 89
Ultrasonics applications 303, 339, 373
Ultraviolet radiation 174
Uranium 341
Vegetable crops 120, 123, 125
Vegetable products 130–132
Vibrations 290, 455–457
Walleye 389, 425, 427
Waste treatment 347, 348, 350, 351
Waterfowl 380
Waxes (paraffin) 152
Wheat 6, 48, 55, 58, 115
Whitebean 9, 20, 113
Whitefish 385, 395, 398
Wildlife 377–381, 435–438
Wines 129
Wolf 379
Wood chemistry 161
Wood (properties) 320, 324, 355
Wool 170
X-ray analysis 466
Yeasts 127
Zoology 435–441

AGRICULTURE

I

DEPARTMENT OF AGRICULTURE

Kemptville Agricultural School Kemptville, Ontario

BEACH, M. E. — Effect of different methods of propagating lactic starters upon their rates of growth and activity.....	1
The numbers of alkaline forming bacteria in fresh creamery butter and their relation to other indices of quality	2
BURNETT, K. A. — A survey of the flavour qualities of milk stored in farm bulk coolers.....	3
IRVINE, O. R. — A study of the defective flavour which develops in the surface of block cheese.....	4
IRVINE, O. R. and BURNETT, K. A. — A comparison of fresh versus composite samples for determining the fat and protein content of cheese factory milk supplies.....	5
SKEPASTS, A. V., STINSON, F. A. — Comparative adaption of varieties of oats, barley and winter wheat.....	6
Varieties and culture of sunflowers for oil seed production	7
Soybean varieties and culture.....	8
Whitebean variety comparisons.....	9
STINSON, F. A., SKEPASTS, A. V. — Evaluation and comparison of adopted species, varieties, mixtures and methods of management of perennial forage legumes and grasses.....	10
Establishment and production of annual forage crops.....	11
Culture and comparison of field corn hybrids for Eastern Ontario.....	12

Western Ontario Agricultural School and Experimental Farm Ridgetown, Ontario

BALDWIN, C. S., BROADWELL, C. E. ¹ — Effect of nitrogen on the yield, % sucrose, and clear juice purity of sugar beets.....	13
¹ Canada and Dominion Sugar Company, Chatham, Ontario.	

AGRICULTURE

BALDWIN, C. S., STEVENSON, C. K. — The effect of time and method of application of N, P ₂ O ₅ and K ₂ O applied to corn in a corn-soybean-wheat rotation.....	14
The effect of time, rate, and source of nitrogen on the growth and yield of grain corn.....	15
BALDWIN, C. S. — The effect of rate and method of application of potassium on the growth and yield of grain corn.....	16
The effect of two varieties, two row widths, and four populations on the growth and yield of grain corn grown on a clay loam soil of (a) high fertility, (b) low fertility.....	17
Fertility response studies of corn grown on soil that has been uniformly managed during a 25-year period (1939-1963).....	18
The effect on growth and yield, of corn and soybeans, of applying liquid applications of N, P ₂ O ₅ and K ₂ O on the seed at planting time.....	19
The effect of time, rate, and source of nitrogen on the growth and yield of white beans.....	20
The effect of varying rates of sulphur on the germination, growth and yield of grain corn.....	21
The effect on yield and soil physical condition of various management and fertility practices applied to grain corn	22
BROWN, R. — Performance herbicides on nine strawberry varieties	
Screening herbicides for weed control in potatoes	24
Performance herbicides for weed control in potatoes.....	25
Performance herbicides for weed control in asparagus.....	26
Screening herbicides for weed control in onions.....	27
Performance herbicides for weed control in onions.....	28
Screening new herbicides for weed control in sweet corn	29
Performance herbicides for weed control in sweet corn.....	30
Performance herbicides for weed control in pickling cucumbers	31
Growth regulation of snapbeans with TIBA.....	32
Screening herbicides for weed control in snapbeans.....	33
Performance herbicides for weed control on snapbeans.....	34
Performance herbicides on lima beans.....	35
Effects of herbicides on six bean species.....	36
Performance herbicides for weed control in transplanted tomatoes.....	37
Variety evaluation of potato varieties.....	38
Fall hothouse tomato variety trial.....	39

AGRICULTURE

BROWN, R. — Spring hothouse tomato variety trial.....	40
The effect of linuron and adjuvants on carrots at various stages of growth.....	41
 BROWN, R., DEAN, L. A. — Effects of diazinon — lindane — captan combinations (seed treatments) on seed germination of ten seed crops after 0, 4, 8, and 12 months in storage.....	42
Methods of application of aldrin for northern corn rootworm control.....	43
Performance insecticides for northern corn rootworm control in field corn.....	44
Methods of application of insecticides for northern corn root- worm control in field corn.....	45
 BROWN R., BALDWIN C. S.— Corn management \times northern corn rootworm infestations. Combinations of N-P-K, manure, stalks, and non stalks and their influence on rootworm in- festations.....	46
 CURTIS, J. D., McLAREN, A. D. ¹ — Evaluation and comparison of winter barley lines, strains and varieties.....	47
Evaluation and comparison of winter wheat lines, strains and varieties.....	48
Evaluation and comparison of spring oats lines, strains and varieties.....	49
Evaluation and comparison of spring barley varieties.....	50
Evaluation and comparison of soybean lines, strains and varieties.....	51
Soybean production practices involving variety \times row width \times rate and date of growth regulating chemicals.....	52
Soybean production practices — variety \times nitrogen \times row width \times growth regulator.....	53
Soybean production practices — variety \times date of planting as it affects yield, etc.....	54
Wheat production practices — variety \times row width \times growth regulators.....	55
Oat production practices — variety \times row width \times growth regulators.....	56
Oat production practices — variety \times rate + date of growth regulation.....	57

¹ Ontario Cereal Committee.

AGRICULTURE

FRANK, R., — Weed control × growth regulators × varieties of winter wheat.....	58
FRANK, R., BROWN, R. — Screening new herbicides for weed control in transplanted tomatoes.....	59
Effects of various amiben formulations on tomatoes.....	60
Propanil — insecticide combinations × dates of application on tomatoes to evaluate possible injury.....	61
Time of application of BV207 on tomatoes to evaluate possible injury and effectiveness as a herbicide.....	62
Time of application of propanil on tomatoes to examine possible injury and effectiveness as a herbicide.....	63
Performance herbicides for weed control in sorghum.....	64
Herbicides applied to create a "stale" seedbed for soybeans..	65
Screening new herbicides for weed control in soybeans.....	66
Trifluralin for weed control in soybeans.....	67
Post-emergence herbicides for weed control in soybeans.....	68
Pre-emergence weed control in soybeans.....	69
Pyrazon, T.C.A., and Pyrazon — T.C.A. combinations for weed control in sugar-beets.....	70
Screening new herbicides for weed control in sugar-beets....	71
Post-emergence application of pyrazon with various adjuvants at various rates on sugar-beets.....	72
Post-emergence application of pyrazon with and without adjuvants at different stages of the crop for weed control in sugar-beets.....	73
Pre-emergence and incorporation of D263 and pyrazon for weed control in sugar-beets.....	74
Performance herbicides for weed control in field beans.....	75
Screening post-emergence herbicides for weed control in corn	76
Screening pre-emergence herbicides for weed control in corn	77
Linuron with and without adjuvants for weed control in corn	78
Atzarine with and without adjuvants for weed control in corn	79
LUCKHAM, D. G.—Studies of feedstuffs, feed additives, feed processing, feeding programs, pullet-rearing programs and management practices with laying hens, broilers (chicken and turkey) and market turkeys	80
Concentrate and high moisture corn for market turkeys — feeding program from 8-24 weeks of age.....	81

AGRICULTURE

LUCKHAM, D. G. — Effect of time of application of skip-day feeding on sexual maturity and reproductive performance of replacement Leghorn pullets.....	82
Ensiled high-moisture corn and soybeans for laying hens — A 16% protein mixture of high moisture corn and cracked soybeans sealed in a silo at corn harvest time.....	83
Effect of de-beaking turkeys fed diets of various physical composition — mash vs pellets vs pelleted concentrate plus whole grain diets.....	84
Effect of all corn and all wheat diets on egg quality.....	85
Effect of various methods of restricting feed intake of growing pullets—(1) Reproductive performance during the pullet laying year — (2) Reproductive performance during a second laying year following forced molting.....	86
Oleandomycin vs. other antibiotics for growth promotion in broiler chicks — antibiotics used are oleandomycin, chlortetracycline and a mixture of penicillin, bacitracin and streptomycin.....	87
Raw soybeans as protein supplement in laying diets.....	88
Ensiled high-moisture corn in poultry feeds — including ensiled corn dried, amino acid supplementation for chicken broilers, turkey broilers and laying hens.....	89
Effect of skip-feeding and de-beaking on sexual maturity of meat-type broiler breeders.....	90
Effect of de-beaking and plastic spec's on the reproductive performance of Leghorn hens.....	91
Steam process vs dry process for pelleting poultry feeds.....	92
MACDONALD, J. A., WINFIELD, R. G. — Study of the keeping qualities of high-moisture shelled corn in conventional silos	93
MCCLAREN, A. D.—The evaluation of bird's-foot trefoil strains and varieties.....	94
The progressive development of forage species during the growing season.....	95
The evaluation of hybrid sorghums, sorghum × sudan crosses and hybrid sudans for forage.....	96
The evaluation of bromegrass strains and varieties.....	97
The evaluation of orchard grass strains and varieties.....	98
The evaluation of alfalfa strains and varieties.....	99

AGRICULTURE

MCCLAREN, A. D. — The effect of various combinations of legumes and grass on yield of forage.....	100
Sugar-beet production practices — population and accuracy of stand.....	101
The evaluation of (a) unlicensed corn hybrids and (b) presently licensed and recommended corn hybrids for grain.....	102
The evaluation of sugar-beet hybrids and varieties.....	103
MCCLAREN, A. D., CURTIS, J. D. — The evaluation of field bean lines, strains and varieties.....	104
Field corn production.....	105
(a) Date of planting \times hybrid \times population.	
(b) Population \times row width \times hybrid and planting pattern.	
(c) Tillage methods for corn.	
The effect of a growth regulator on field beans grown in 3 row widths on 3 levels of residual nitrogen.....	106
STEVENSON, C. K. — An evaluation of various sub-soil spacings and plowing depths on a clay soil using corn and soybeans as indicator crops.....	107
The effect of foliar applications of manganese on the yield of soybeans.....	108
Response of a trefoil-timothy mixture to various rates and times of N, P ₂ O ₅ and K ₂ O application.....	109
STEVENSON, C. K., BALDWIN, C. S. — Response of grain corn to varying rates of nitrogen applied as a side dressing.....	110
Economic investigation of a rotation of oats—hay—hay—corn—soybeans grown on a clay soil tilled at (a) 40 foot, and (b) 80 foot intervals.....	111
A study of the growth and yield of soybeans of varying rates of N, P ₂ O ₅ and K ₂ O, band vs broadcast.....	112
WALLACE, J. M. — Crop cost and production practices — White beans (Middlesex County).....	113
Crop cost and production practices — Oats (Middlesex County).....	114
Crop cost and production practices — Wheat (Middlesex County).....	115
Crop cost and production practices — Soybeans (Lambton and Middlesex Counties).....	116
Crop cost and production practices — Grain corn (Lambton and Middlesex Counties).....	117

AGRICULTURE

WINFIELD, R. G. — Liquid manure handling	118
--	-----

Ontario Demonstration Farm, New Liskeard, Ontario

BUTLER, J. D., BOWMAN, G. ¹ , RENNIE, J. C. ¹ — Genetic improvement of beef cattle production through the use of performance-tested sires	119
---	-----

Horticultural Experiment Stations, Vineland Station, Ontario

ARCHIBALD, J. A., COLLIN, G. H., RICKETSON, C. L., WHITTY, C. D. — Effect of growth-regulating chemicals on fruit and vegetable crops (4 projects)	120
--	-----

ARCHIBALD, J. A., CLINE, R. A., COLLIN, G. H., MERCIER, R. G., RICKETSON, C. L., WIEBE, J. — Effect of micro-climate and other environmental factors on growth and yield of selected horticultural crops (3 projects)	121
---	-----

ARCHIBALD, J. A., BRADT, O. A., CLINE, R. A., FLEMING, R. A., FORSTER, R. R., HUTCHINSON, A., WHITTY, C. D., WIEBE, J. — Propagation, pruning, training, spacing and hardiness studies with horticultural crops (30 projects)	122
---	-----

ARCHIBALD, J. A., BRADT, O. A., CLINE, R. A., COLLIN, G. H., FLEMING, R. A., FORSTER, R. R., REISSMANN, H. J., RICKETSON, C. L., WHITTY, C. D., WIEBE, J. — Studies in plant nutrition, soil management, and fertilizer use with fruit, vegetable and ornamental crops (24 projects)	123
--	-----

KERR, E. A., FLEMING, R. A., FORSTER, R. R. — Breeding and variety testing of ornamental plants — rhododendron, holly, lily, gladiolus, clematis, and outdoor chrysanthemum (6 projects)	124
--	-----

KERR, E. A., COLLIN, G. H., WIEBE, J. — Breeding and variety testing of vegetable plants — greenhouse and outdoor tomatoes, sweet corn, greenhouse cucumbers, sweet potatoes, peppers and potatoes (20 projects)	125
--	-----

KERR, E. A., BRADT, O. A., HUTCHINSON, A., RICKETSON, C. L., WHITTY, C. D. — Breeding and variety testing of fruit plants — apple, pear, cherry, plum, peach, apricot, grape, strawberry and currant (14 projects)	126
--	-----

¹ Department of Science; University of Guelph.

AGRICULTURE

Horticultural Products Laboratory, Vineland Station, Ontario

ADAMS, A. M. — Yeasts (6 projects).....	127
Spoilage bacteria (3 projects).....	128
CROWTHER, R. F. — Wines (15 projects).....	129
SYER, MARGARET, LANGTON, ANN, TRUSCOTT, J. H. L. — New fruit and vegetable products (12 projects).....	130
TRUSCOTT, J. H. L. — Cold storage of fruit and vegetables (5 projects).....	131
TRUSCOTT, J. H. L., SYER, MARGARET — Canning and freezing of fruits and vegetables (11 projects).....	132
ZUBECKIS, E. — Fruit juices, concentrates, essences and syrups (6 projects).....	133
Fruit chemistry (6 projects).....	134

ONTARIO RESEARCH FOUNDATION

Department of Physiography

BROWN, D. M., FELCH, R. E. — Corn ecology — a study of the adaptation of the various hybrids in the different climatic zones of Ontario.....	135
--	-----

HYDRO-ELECTRIC POWER COMMISSION OF ONTARIO

Research Division

SUGGITT, J. W. — Study of the effectiveness of, and application methods for, viscous sprays for woody-growth control.....	136
---	-----

ARCHITECTURE

II

DEPARTMENT OF EDUCATION

Division of School Planning and Building Research

- NICOL, F. J. K., WIMBS, J. B. — School planning..... 137

DEPARTMENT OF TRANSPORT (FOR ADMINISTRATION)

Metropolitan Toronto and Region Transportation Study

- WADE, P. E., GAGNONG, W. G., SCHMIDT, A. R., SINCLAIR, M. H.¹,
VANCE, J. A. — A study to devise a co-ordinated network
for transporting persons and goods by the most effective
means available for a large region centred by Toronto.... 138

¹ Department of Municipal Affairs.

CHEMISTRY
III

DEPARTMENT OF AGRICULTURE

MacDonald Institute

- RICHARDS, H. R., FRANK, MISS G. C. — Basic studies of polymers containing phosphorus and nitrogen..... 139

DEPARTMENT OF THE ATTORNEY GENERAL

Attorney's General Laboratory

- BROHIER, G., BARTHA, A., HEAD, G., SCHROEDER, E. — Decipherment of charred documents..... 140

- CLAIR, E. G., LI, A. — The application of emission spectroscopy to the analysis of tiny samples encountered in criminalistics 141

- FAN, M. C., WALD, MRS. W. G. — Decomposition of p-aminosalicylic acid preparations..... 142

- Quantitative analysis of mixtures of anti-tubercular agents using ion exchange chromatography..... 143

- FUNK, H. J., TOWSTIAK, W. — Fibre identification — optical and chemical properties using gas chromatography, infra-red spectrography and polarizing microscope with compensators 144

- GUPTA, R. C., CIMBURA, G., FABERKIEWICZ, (MRS.) C., KOFOED, J. — Analytical toxicological research on alkaloids..... 145

- HALL, A. E. D., MORINO, MISS K. K. — Quantitative analysis of barbiturate elixirs using ion exchange chromatography 146

ONTARIO RESEARCH FOUNDATION

Department of Materials Chemistry

- ARMSTRONG, W. N. B., MARSON, R. — Studies of the structural and surface properties of chrysotile asbestos using differential thermal analytical techniques..... 147

CHEMISTRY

ARMSTRONG, W. N. B., MURTHY, M. K. — Structure and properties of glasses based on germanium dioxide.....	148
Crystal chemical studies and phase equilibria in systems containing germanium dioxide.....	149
ARMSTRONG, W. N. B., KUNTZE, R. A. — Physical chemistry of gypsum and its dehydration products.....	150
False-set of Portland cement.....	151
ARMSTRONG, W. N. B., MARTIN, R. J. — Air oxidation of paraffin waxes.....	152
ARMSTRONG, W. N. B., PERLUS, T. G. — Durability of organic zinc-rich coatings.....	153
ARMSTRONG, W. N. B., MURTHY, M. K., WESTMAN, A. E. R. — Structure, constitution and properties of condensed phosphates using paper and ion exchange chromatography.....	154
ARMSTRONG, W. N. B., BROWN, E. C., KUNTZE, R. A. — The calcination, hydration and recarbonation of limestone and lime	155

Department of Organic Chemistry

REID, S. G., DAS, B. S. — Chemistry of organo-silicon compounds	156
REID, S. G., SHAW, A. C. — Chemistry of black-fly attractants...	157
REID, S. G., HUGHES, H. — Chemistry of pest-control chemicals particularly chemisterilants	158
REID, S. G., LOMAS, H. — Chemistry of wet strength resins in paper.....	159
REID, S. G., SOWA, W., THOMAS, G. H. S. — Use of carbohydrates as intermediates in organic syntheses.....	160
REID, S. G., BRAJSA, MISS B., LADELL, J. L., THOMAS, G. H. S. — Study of properties of wood grown in Ontario and the relation of these properties to end uses of the wood, particularly pulp and paper.....	161

CHEMISTRY

Department of Industrial Biochemistry

HENRY, W. C., KIRBY, MISS E. M. — Infra-red spectroscopy of fatty acids.....	162
HENRY, W. C., LEMON, H. W. — The effect of catalysts and operating variables on selectivity and isomerization during hydrogenation of oils and fats.....	163

Department of Physical Chemistry

FRANCIS, T. — Study of the reactions of isocyanates with alcohols, sulphonamides, and sulphonyl hydrazides.....	164
JONES, M. H., CHOW, D. — Synthesis of fluorinated epoxides as starting materials for the preparation of fluorinated polyethers — potential high temperature lubricants.....	165
JONES, M. H., FRANCIS, T. — Synthesis of organic chemical blowing agents with novel properties for use in foamed plastics.	166
McADIE, H. G. — Preparation of new materials with lattice structures of the molecular sieve type as potential absorbents and catalysts.....	167
Study of the properties and structure of inclusion compounds of the area and quinol clathrate types.....	168
SEFTON, V. B. — Development of a continuous analyser for atmospheric fluorides.....	169

Department of Textile Research

GOODINGS, A. C. — Structural modification of wool and hair to exploit changes in the fibre which can be induced chemically, with particular reference to rigidity and ease of extension..	170
GOODINGS, A. C., CAMPBELL, H. J., STAPLES, M. L. — Chemical modification of cellulosic fibres to improve existing properties of fabrics with particular reference to crease resistance qualities (wash-wear properties)	171

CHEMISTRY

HYDRO-ELECTRIC POWER COMMISSION OF ONTARIO Research Division

SUGGITT, J. W. — Evaluation of pelleted and liquid formulations of woody-growth-control chemicals.....	172
Evaluation of total-growth-control chemicals.....	173
Study of aging of clear coating films by ultra-violet radiation	174
Study of the heat stability of fabrics.....	175
SUGGITT, J. W., CORDINGLEY, D. C. — Effect of petroleum oil com- position on physical properties of polyethylene resins in contact with such oils.....	176

EARTH SCIENCES

IV

DEPARTMENT OF THE ATTORNEY GENERAL

Attorney's General Laboratory

FRENKEL, ODED J. — Study of the variability of the mineralogical and other properties of soils in Ontario, to find if soils can be used as tools of criminal investigation and as courtroom evidence	177
--	-----

DEPARTMENT OF ENERGY AND RESOURCES MANAGEMENT

Conservation Authorities Branch

GRYNIEWSKI, P., BALFOUR, J., CAMPBELL, C., CAMPBELL, H., CHANG, R., HORNING, G., MCKAY, J., MULHOLLAND, W., SHANNON, E., SHARPLES, M. — Hydrology of the Maint-land River and the Cataraqui Region	178
--	-----

LATORNELL, A., ALRIDGE, J., WEBER, E., WRIGHT, A. — Land classification in Grand River and Kettle Creek Valleys.....	179
--	-----

MURRAY, J. W., McMULLEN, D. N. ¹ — Fullarton small water- shed hydrologic study	180
---	-----

Energy Branch

SHARP, D. A., BRIGHAM, R. J. ² — Research and development of computer applications to aid in the exploration of oil and gas in Ontario:	181
--	-----

HYDRO-ELECTRIC POWER COMMISSION OF ONTARIO

Research Division

ADAMS, J. I., HANNA, T. H. — Detailed study of the geological history, structure and engineering properties of the post-glacial lake deposits near Courtright, Ontario.....	182
---	-----

¹ Meteorological Branch, Department of Transport (Federal)

² University of Western Ontario.

EARTH SCIENCES

ONTARIO RESEARCH FOUNDATION

Department of Physiography

BROWN, D. M., CHAPMAN, L. J. — Climate of the areas bordering Lake Erie and Lake Huron	183
CHAPMAN, L. J., HILL, W. B. ('62-'64) — Mapping glacial features and deposits in the area between Georgian Bay and the Ottawa River	184

ONTARIO WATER RESOURCES COMMISSION

Research Division

HARRIS, A. J., BLACK, S. A. — Sewage effluent diffusion in large bodies of water.....	185
--	-----

ENGINEERING

V

DEPARTMENT OF THE ATTORNEY GENERAL

Office of the Fire Marshal

AMIRO, G. T. — A study of the fire hazards associated with rubbish disposal and incineration in apartment buildings.....	186
--	-----

DEPARTMENT OF EDUCATION

Division of School Planning and Building Research

NICOL, F. J. K., WIMBS, J. B. — School construction components system.....	187
--	-----

DEPARTMENT OF HIGHWAYS

Road Design Division

FARREN, D. W. — Development of safe side slopes for highways..	188
Warrants for urban highway crossings.....	189
Highway illumination methods and standards.....	190

Traffic and Planning Studies Section

FORSTER, J. L., HARMELINK, M. D., RAYCROFT, A., SEELEY, M. — Evaluation of freeway signs.....	191
JOHNSTON, G. H., HARMELINK, M. D. — Highway trip generation and attraction in rural areas.....	192
TRUE, J. S. — Flashing beacons on stop signs.....	193

Research Section

CHOJNACKI, B. — Performance of sealing compounds for joints in rigid pavements (0634).....	194
Evaluation of concrete curing and sealing compounds (0060). 195	
Investigation of alkali-reactivity of Ontario aggregates (0635). 196	

ENGINEERING

CHONG, G. — Influence of type and thickness of structural components on deflection under loads (0632).....	197
Economic significance of vehicular load limitation. Part II — Pavements (0664).....	198
DUGGAL, A. N. — Inter-city traffic generation (0649).....	199
DUNIKOWSKA, Z. — Classification of chert for use in highway construction.....	200
FROMM, H. J. — Investigation of the cracking of flexible pavements (0623).....	201
Evaluation of corrosion inhibitors for use in salt used for winter maintenance of highways (0659).....	202
Chromatographic analysis of paving asphalts.....	203
HARTELINK, M. D. — Warrants for left-turn lanes (0654).....	204
Estimation of annual average daily traffic and design hour volumes from the results of short surveys. (0647).....	205
LESLIE, A. — A full-scale bases and surfacings experiment on Highway 10, Brampton, Ontario (0640).....	206
SCHONFELD, R. — Factors affecting skid resistance of highway pavements (0627).....	207
TAMBERG, K. G. — Economic significance of vehicular load limitation. Part I — Bridges (0662).....	208
Bridge design loads (0653).....	209
WOLFE, R. I. — Recreational transportation in Ontario.....	210

Materials and Testing Division

CHOJNACKI, B. — Methods of getting an early estimate of the strength of concrete (0617).....	211
CORKILL, J. — Factors affecting the performance of asphalt pavements (0608).....	212
Bridge deck water-proofing systems.....	213
LO, K. Y. — Long-term observation of pore pressures and settlements beneath a high embankment on varved clay.....	214
Pore pressures set up in soils during pile draining operations..	215
Strength recovery of disturbed clays (0631).....	216
Anisotropy of clays.....	217
Bearing capacity of friction piles in stiff clays.....	218

ENGINEERING

PHANG, B. — Use of fillers in bituminous paving mixtures.....	219
PHANG, W. — Effect of additives on coating and stripping of asphaltic concrete (0651).....	220
PHANG, W. and FIELD, B. — Study of thin bituminous overlays, design and performance.....	221
RYELL, J. — Effect of cement characteristics on performance of admixtures for Portland cement concrete (0661).....	222
The occurrence of false-set in Portland cement concrete.....	223
SMITH, P. — Methods of repairing joints in concrete roads.....	224
Use of light-weight concrete in bridges.....	225
Joint design for concrete pavements.....	226
SMITH, P., SELMINS, G. — Sands from central and northern Ontario which accidentally entrain air in concrete.....	227
SMITH, P., WOOLGER, G. — Study of volume changes in concrete especially as they affect concrete pavement performance..	228
SMITH, P., KIP, A. — Factors affecting the selections of the type of construction used on highways.....	229
SUTER, A. C., HARMELINK, M. D., RAYCROFT, G. — All-weather lane markings for highways.....	230
VINCENT, P. T. — Determination of corrosion of reinforcing steel in concrete.....	231

HYDRO-ELECTRIC POWER COMMISSION OF ONTARIO

Research Division

ADAMS, J. I. — The design and construction of a 540-psi triaxial cell with a fully automatic K control system, for testing 2-inch-diameter soil samples.....	232
Development of laboratory test methods for determining the susceptibility of compacted clay fills to cracking.....	233
— Development of methods for laboratory testing of varved clays.....	234
Laboratory and field studies of the engineering behaviour of muskeg.....	235
Laboratory model and field study of the uplift capacity of foundations in sand and clay.....	236

ENGINEERING

ADAMS, J. I., HANNA, T. H. — Analysis of the stability of a sloping-core rock, fill dam during rapid drawdown conditions.....	237
A study and analysis of the driving performance and loading behaviour of instrumented pipe and H-section piles driven to a depth of about 140 feet in soft clay.....	238
The in-situ measurement of horizontal movement and vertical heave of a soft clay, caused by a deep excavation.....	239
Determination of the anisotropic properties of soils by correlation of the results of in-situ horizontal-plate bearing tests with those of laboratory tests on horizontal and vertical samples.....	240
CAMERON, A. W. W., JONES, A. S. — Study of service aging of distribution cables.....	241
CAMERON, A. W. W., KURTZ, M. — Studies of humidity deposition on electrical insulation surfaces.....	242
Endurance testing of new synthetic insulations for large generators.....	243
Construction and test of pilot installation of a novel low-cost oil-insulated 115-kv cable.....	244
Development of low-cost underground-distribution-system splices and terminations and their extension to 46-kv rating.	245
Study of thermal aging in high-voltage cable insulation.....	246
Measurement of surface-breakdown properties of various electrical insulations under conditions of precipitation and contamination.....	247
Measurement of short-time and long-time performance of novel electrical insulations.....	248
Development of a flammability test for wire and cable insulation with particular reference to cables used in pressurized tunnel construction.....	249
CAMERON, A. W. W., LINCK, H. — Establishment of probability data for lightning voltages in transmission lines and stations.....	250
Investigation of performance of protective gaps under lightning and switching surges, with special reference to extra-high-voltage systems.....	251

ENGINEERING

CAMERON, A. W. W., LINCK, H. — Analyses of surge characteristics of transformers and generators.....	252
CAMERON, A. W. W., LISHCHYNA, L. — Investigation of effect of lightning currents on distribution fuses.....	253
CAMERON, A. W. W., McHENRY, B. L. — Investigation of benefits of improved high-direct-voltage insulation testing techniques, particularly for large generators.....	254
Study of measurement and simulation methods for hot-spot temperatures of large power transformers and generators..	255
CAMERON, A. W. W., WATSON, W. — Measurement and analysis of switching surges in 500-kv transmission lines.....	256
Studies of behaviour of large interconnected electric power systems, including effects of governors, and computer studies of voltage-regulator effects.....	257
Analogue study of overvoltages at neutrals of ungrounded 230-kv transformers.....	258
Studies of effects of electric-arc furnaces on power systems..	259
CAMERON, A. W. W., McHENRY, B. L., IWANUSIW, O. W. — Improvement of accuracy of measurement of large power outputs.....	260
CAMERON, A. W. W., McHENRY, B. L., WATSON, W. — Development of accurate methods to measure speed variations of large hydro generators under transient conditions.....	261
CAMERON, A. W. W., JONES, A. S., KURTZ, M. — Development of calibrating methods for ionization measurements on apparatus insulation.....	262
CASSAN, J. G., BALJET, A. F. — Development of electric baseboard space heater.....	263
CASSAN, J. G., DAVIDSON, G. E. — Performance of fluorescent street-lighting luminaires under a wide range of ambient temperatures.....	264
CASSAN, J. G., EDGAR, J. N. — Investigation of problems of electrostatic induction under ehv transmission lines.....	265
Appraisal of short-circuit performance of electric conductors and hardware.....	266
Investigation of grounding methods for electric power transmission and distribution systems.....	267

ENGINEERING

CASSAN, J. G., NIGOL, O. — Corona performance of artificially contaminated high-voltage line hardware.....	268
Methods for locating oil and gas leaks in underground cable circuits.....	269
CASSAN, J. G., WEST, G. H. — Investigation of electric-storage-space-heating for residences.....	270
Experimental installation of residential heat pumps.....	271
Applications of artificial cooling to underground high-voltage cables.....	272
CASSAN, J. G., ZOB, A. P. — Development of design methods for commercial water-heating systems.....	273
CASSAN, J. G., ADAMS, J. I., BALJET, A. F. — Investigations of soil thermal resistivity and moisture migration phenomena.	274
CASSAN, J. G., EDGAR, J. N., FITZGERALD, G. W. N. — Methods of evaluating performance of contaminated high-voltage insulators.....	275
CLENDENNING, T. G., CHAPIN, C. — Quick-setting, shotcrete — a comparison of physical properties of pneumatically placed concrete incorporating various accelerating admixtures.	276
CLENDENNING, T. G., LOUGHBOROUGH, M. T. — False-setting in Portland cement — its causes, its effects, and methods of control.....	277
Study of the causes and means of alleviation of cracking in gypsum plaster.....	278
Evaluation of moisture condition of concrete in service and the influence of moisture level on the properties of concrete.	279
CLENDENNING, T. G., STURRUP, V. R. — Study of various means of control of cracking in concrete through control of temperature gradients.....	280
Evaluation of the influence of high-strength reinforcement on the behaviour of reinforced concrete.....	281
Development and trial of accelerated control tests of the compressive strength of concrete.....	282
Re-evaluation of existing criteria for designing concrete for durability in hydraulic structures.....	283

ENGINEERING

CLENDENNING, T. G., CHAPIN, C., STURRUP, V. R. — Evaluation of the durability of concrete structures in service.....	284
CLENDENNING, T. G., MANTUANI, L. D., STURRUP, V. R. — Evaluation of the durability of concrete through outdoor exposure tests.....	285
FITZGERALD, G. W. N., LINCK, H. — Study of measurement techniques for very steep wavefronts (4000-kv per micro-second) and calculation of impulse-testing circuit parameters.....	286
HARRISON, D., FERRIE, J. S. — Change of air and water content of transformer oils in service.....	287
Solubility of water in turbine lubricating oils.....	288
HOGG, A. D. — Investigation of mechanical service loads on transmission-line towers.....	289
HOGG, A. D., EDWARDS, A. T. — Studies of nature of, and means for controlling fluid pulsations in steam pipes and associated instrument lines.....	290
HOGG, A. D., GUNG, G. — Study of settlement of heavy structures for purpose of correlation with structural defects and alignment difficulties in heavy machinery.....	291
HOGG, A. D., HAVARD, D. G. — Study of fatigue life of metallic sheathing materials for electrical conductors.....	292
Investigation of stresses in horizontal cylindrical tanks and pipes.....	293
HOGG, A. D., WILLMOT, J. G. — Investigation of reinforcing-bar service loads in concrete scroll cases.....	294
Investigation of parameters of importance in the phenomenon of turbo-planning in hydraulic turbines.....	295
Investigation of scroll-case pressures during changes in flow..	296
JACOBSEN, R. C. — Miscellaneous studies pertaining to problems of corrosion and cathodic protection of underground pipes and cables, tower footings and piles and water-heater tanks, that arise in day-to-day operations.....	297
Field trials of domestic electric hot-water heaters and their components.....	298

ENGINEERING

LESLIE, J. R., BROWN, R. D. — Study of digital telemetering and display systems.....	299
Solid-state protective relays.....	300
Power-swing relay for predicting generation instability — application and experience.....	301
LESLIE, J. R., KEYSER, G. M. — Measurement of low-frequency and other noise voltages on control cables in large plants....	302
LESLIE, J. R., KORTSCHINSKI, J. — Conductor-temperature-telemetering system for high-voltage lines, by means of ultrasonics.....	303
Transient-fault location on ehv lines.....	304
LESLIE, J. R., REICHMAN, J. — Use of insulated overhead ground wires on high-voltage lines for communications and relaying	305
LESLIE, J. R., STELTER, M. K. G. — Remote temperature measurements on high-voltage apparatus by means of infra-red radiation.....	306
LESLIE, J. R., BOZOKI, B., PERZ, M. C. — Frequency-shift carrier relaying equipment — study of alignment procedures and of response in presence of noise.....	307
LESLIE, J. R., KEYSER, G. M., KORTSCHINSKI, J. — Ice detection and monitoring schemes for high-voltage lines.....	308
LESLIE, J. R., HICKS, R. L., KEYSER, G. M. — Location of faults in electric heating cables.....	309
LESLIE, J. R., JONES, D. E., REICHMAN, J. — Study of radio and television interference problems from ehv, hv, and lv power lines.....	310
LESLIE, J. R., BOZOKI, B., JONES, D. E., PERZ, M. C. — Carrier frequency studies on high-voltage lines — propagation, attenuation spectrum usage, coupling, and operations during faults.....	311
Shelson, W., Templeton, J. G. C. — Optimum safety stocks in coal-ordering for thermal power stations.....	312
SIMPSON, F. J., BROWN, T. A. — Long-term study of the effect of field service on the fatigue life and other mechanical properties of power conductors.....	313

ENGINEERING

SIMPSON, F. J., BROWN, T. A. — Investigation of effect on physical properties of both acsr and all-aluminum conductor, of operation at relatively high temperatures.....	314
SIMPSON, F. J., HOLMES, B. A. — Study of the cavitation resistance of metals and alloys.....	315
Simpson, F. J., MARTIN, W. A. — Studies of the toxicity of fumes from the spraying and welding of stainless steels.....	316
Long-term study of atmospheric corrosion of metals and metallic coatings.....	317
Long-term study of aqueous corrosion of metals and metallic coatings.....	318
Studies of physical stability of transport and work equipment vehicles.....	319
SIMPSON, F. J., PLATT, J. C. — Study of strength of full-size wood poles, and correlation with laboratory test data from small specimens.....	320
Study of properties and applications of synthetic fibre ropes.	321
SIMPSON, F. J., WALKER, R. F. — Investigation of the resistance of cast aluminum alloys to stress corrosion.....	322
SUGGITT, J. W. — Continuous study of preservatives for organic materials.....	323
Study of long-term effectiveness of preservatives in wood poles in service.....	324
Laboratory and field appraisals of elastomeric joint sealants..	325
Laboratory and field appraisal of non-metallic protective coatings for underwater steel.....	326
SUGGITT, J. W., CORDINGLEY, D. C. — Long-term study of properties and applications of elastomeric materials.....	327
Evaluation of properties and application of adhesive materials.	328
Possible applications for plastic piping in thermal generating stations.....	329
SUGGITT, J. W., GRAFT, C. M. — Evaluation of surface preparation for metals prior to painting.....	330
SUGGITT, J. W., KELLAM, B. — Methods of using plastic materials as jackets for cables.....	331
Determination of fire hazards inherent in use of plastic materials, and development of pertinent test methods.....	332

ENGINEERING

VANDERLECK, J. M. — Development of statistical sampling procedures for the maintenance of in-service accuracy of watt hour meters.....	333
VANDERLECK, J. M., IWANUSIW, O. W. — Relaying accuracy of instrument current transformers under power-system fault conditions.....	334
Development of a system for accurate wide-range demand metering of electric power.....	335

DEPARTMENT OF MINES

Mines Inspection Branch

SMITH, R. L., BARRETT, C.M., PERRY, E. A. ¹ , LANG, J. ² — Non-destructive testing of mine hoisting ropes.....	336
--	-----

ONTARIO RESEARCH FOUNDATION

Department of Organic Chemistry

REID, S. G., MATOLCSY, G. — Study of relation of fibre characteristics and properties of paper.....	337
---	-----

Department of Engineering and Metallurgy

CAVANAGH, R. L., FORMAN, J. — Jet smelting project — reduction and smelting of fine iron ore in one step.....	338
---	-----

CAVANAGH, R. L., LAST, A. J. — Ultrasonic application — research and development in the use of ultrasonic energy in processing in various industrial fields.....	339
--	-----

CAVANAGH, R. L., MARTIUS, U. — Magnetic properties of iron ore.	340
---	-----

CAVANAGH, R. L., MICHAUD, G. — Uranium metals project — study of uranium — iron phase diagram, high iron portion.	341
---	-----

CAVANAGH, R. L., RISDON, A. — Investigation of pellet binders for iron ore concentrates.....	342
--	-----

¹ Ontario Mining Association
McPhar Geophysics Limited.

ENGINEERING

CAVANAGH, R. L., ALLEN, C., KARZEKWA, T. — Ferrous Metallurgy Research — Development of new ideas, processes in fields of process metallurgy and ore dressing.....	343
CAVANAGH, R. L., BRATINA, J., McGRATH, J. — Metal Physics Research — Study of deformation of metals (e.g. fatigue) by non-destructive techniques.....	344

ONTARIO WATER RESOURCES COMMISSION

Research Division

HARRIS, A. J., BLACK, S. A. — Supplementary aeration of waste stabilization ponds for sewage treatment.....	345
HARRIS, A. J., CHRISTIE, A. E. — Sewage oxidation lagoon study— pilot plant — virus removal.....	346
HARRIS, A. J., DART, F. J. — Fibre-sampling technique using 100 mesh screen cone for fibre in streams below paper mill outfalls.....	357
HARRIS, A. J., FIELDING, M. B. — Erosion control at waste stabilization pond berms.....	348
HARRIS, A. J., GUILLAUME, F. — The oxidation ditch for sewage treatment in Ontario.....	349
HARRIS, A. J., SHIKAZE, K. — Aerated lagoons for the treatment of cannery waste.....	350
HARRIS, A. J., THON, J. — A study of municipal waste stabilization ponds for sewage treatment in Ontario..... Sewage sludge dewatering studies..... Tertiary treatment of sewage plant effluent.....	351 352 353

FORESTRY

IV

DEPARTMENT OF ENERGY AND RESOURCES MANAGEMENT

Conservation Authorities Branch

HARVIE, P., COLEMAN, D., EVANS, S., LEBEL, P., KSENYCH, P. — Survey of forest resources of Kettle Creek Valley and Cataraqui Region.....	354
--	-----

DEPARTMENT OF LANDS AND FORESTS

Research Branch

CARMICHAEL, A. J. — Study of the relation of anatomical and chemical wood properties to product quality.....	355
FOWLER, D. P., HEIMBURGER, C. — Tree-breeding work is attempting to develop white pine which is resistant to blister rust — hybrid aspen-type poplars of good growth form and disease resistance — and quality spruce for lowland sites in Northern Ontario.....	356
GORDON, A. G. — To determine the usefulness of red spruce in improving the quality and value of the cutover hardwood stands in Central Ontario.....	357
HADDOW, W. R. — Study of the progress of white pine blister rust in Ontario to determine suitable planting locations.....	358
HILLS, G. A., BOISSONNEAU, A. N., BURGER, D., PIERPOINT, G., WILLIAMS, J. R., ZOLTAI, S. — An assessment of the potential of the forest land area of Ontario for the production of timber and other crops.....	359
HOLOWACZ, J. — Advising on the economic importance of forest research problems.....	360
LARSSON, H. C., JACIW, P. — To develop management techniques for the optimum growth of silver maple in Southern Ontario	361

FORESTRY

LYON, F., KOKOCINSKI, G. -- The development of management techniques to ensure satisfactory reproduction and growth of spruce in the northwestern portion of the province.....	362
McEWEN, J. K. — A study of black spruce regeneration and growth in the Cochrane Clay Belt.....	363
MCLEAN, M. M., ANDERSON, H. — The improvement of low grade tolerant hardwood timber by experimental grading and cuttings.....	364
MULLIN, R. E., GLERUM, C. — Work is conducted to assist in the technical and scientific development of the reforestation program of the Department with particular emphasis on spruce.....	365
SINCLAIR, G. A., STROEMPL, G. — To determine the role of prescribed burning for timber management purposes. Ecology of basswood.....	366
BAKER, M. H., BROHM, H., FOOTE, H., GILBERT, C., McMULLEN, V. — Mechanical Research — Making of special apparatus for Research Branch use and research in special fields outside as forest fighting apparatus. The lubrication of fire pump motor has contributed a great deal.....	367
BECKWITH A. and SVATON, J. — Research in tree measurement — both standing and felled (logs), and the application of statistics to forest studies in general.....	368

LIFE SCIENCES
VII

DEPARTMENT OF AGRICULTURE

Western Ontario Agricultural School and Experimental Farm, Ridgetown

MACDONALD, J. A. — A comparison of haylage — corn silage and haylage — and corn silage and dry hay for milking cows...	369
MACDONALD, J. A., BROWN, R. H. — Horn fly control on beef steers and heifers.....	370
MACDONALD, J. A., LUCKHAM, D. G. — Study of the effects of some additives on ensiled feeds.....	371
MACDONALD, J. A., UNDERWOOD, J. W. — Influence of date planting on the feeding value of corn silage in fattening rations.....	372
MACDONALD, J. A., BURGESS, T. D., UNDERWOOD, J. W. — The estimation of depth of fat on market cattle with ultrasonics.	373

DEPARTMENT OF THE ATTORNEY GENERAL

Attorney's General Laboratory

FUNK, H. J., NEWALL, MRS. P. — Immunology — Haptoglobin grouping on dried blood stains.....	374
PERKONS, A. K., ERICKSON, N., KRISHNAN, S. — Neutron activa- tion on hairs (biological materials e.g. blood etc., soil, glass, paint, firearms discharge, residue arsenic poisoning).	375

DEPARTMENT OF ENERGY AND RESOURCES MANAGEMENT

Conservation Authorities

MAYALL, K., COCHRANE, W. A., JAMES, R. D., STOKER, D. G., T'JON, A. — Fish resources of the Cataraqui Region and Kettle Creek.....	376
--	-----

LIFE SCIENCES

DEPARTMENT OF LANDS AND FORESTS

Research Branch

FYVIE, A., JOHNSTON, D. — Disease and parasites of wildlife — their effects on wildlife populations and their influences on livestock and humans.....	377
HEPBURN, R. L., SIMKIN, D. and ANDERSON, R. ¹ — Big game — populations, distributions, ecology and reproduction of deer, moose and caribou. Effects of weather, hunting, predation, range quality.....	378
KOLENOSKY, G., ADORJAN, A., SHANNON, J. — Predators — populations, distributions, ecology, reproduction of wolf, coyote, black and polar bears — effects of wolf and coyote on wildlife and livestock — development and application of predator control methods.....	379
LUMSDEN, H. G. and EVANS, E. V. ² — Upland game and waterfowl — populations distribution of ruffed and prairie grouse. Studies of reproduction of Canada geese.....	380
STEPHENSON, A. B. — Fur-bearers — populations, distributions, ecology and reproduction of beaver and otter. Effects for trapping, predation, range quality; analysis of harvest statistics for most fur-bearers.....	381

Research Branch — Fisheries

BERST, A., DEWAR, J. E., TAIT, J. S. — To develop through artificial selection, a stable, reproductive hybrid between lake trout and brook trout, which will be capable of living in the Great Lakes habitat formerly occupied by lake trout.	382
To describe the life history and ecology of splake (hybrid between brook trout and lake trout) introduced to natural waters.....	383
To explore the potential of selective breeding of fish as a technique in modern fish management in changing environments.....	384

(1) Ontario Research Foundation
(2) Ontario Agricultural College

LIFE SCIENCES

CHRISTIE, W. J. — To determine and describe the factors causing the violent fluctuations in abundance of whitefish in the Bay of Quinte and Lake Ontario.....	385
To assess the possibility of re-establishing a commercially useful population of lake trout in eastern Lake Ontario while the sea lamprey population continues to exist in the area..	386
To trace the arrival and build-up in Lake Ontario of the white perch, a new species in this lake, and to assess its impact on other resident species.....	387
CHRISTIE, W. J., COBLE, D. — To determine the life history and movements of the American eel in Lake Ontario and tributary waters.....	388
To assess the extent of exploitation by anglers and by commercial fishermen on the walleye population of the Bay of Quinte during times of both scarcity and abundance.....	389
To explore, using trawls, the open part of Lake Ontario for stocks of fish of potential commercial value.....	390
CHRISTIE, W. J., LOFTUS, K. H. — To attempt the introduction of Kokanee, a land-locked variety of sockeye salmon, to Lake Ontario in an effort to complement existing fish stocks with this new species.....	391
COBLE, D. — To study the growth of a number of species, e.g. suckers, yellow perch, etc. using special injections which are deposited in the bones and scales of the fish to form time marks.....	392
COBLE, D., FRY, F., MAHER, F. — To document the contribution of successive year classes of smallmouth bass to the sport fishery of South Bay.....	393
To document through experimental fishing and sampling, the long-term changes in the fish populations vulnerable to pound nets in South Bay, Lake Huron.....	394
CUCIN, D., COLLINS, J., FRY, F., MAHER, F., REGIER, H., SMITH, J. — To discuss and describe the factors influencing the strength of whitefish year classes throughout Lake Huron..	395
DECHTIARENKO, A. — To document the build-up in the smelt of Lake Erie, of the sporozoan parasite, <i>Glugea hertwigi</i>	396

LIFE SCIENCES

To survey the parasites occurring in the important fishes of Ontario and to discover those which may be important influences on abundance of fish.....	397
FABER, D. — To discover and study the factors influencing year class strength (survival of whitefish during their first year of life) of whitefish in South Bay.....	398
FERGUSON, R. G. — To study spawning smelt throughout Lake Erie to determine whether there are discrete spawning populations which may require separate management.....	399
To describe the horizontal and vertical distribution of smelt in Lake Erie and to determine the environmental factors which influence that distribution.....	400
To study the factors related to the alternate strong and weak year classes of smelt in Lake Erie.....	401
To monitor, by sampling, the catches made by Lake Erie commercial fishermen in order to assess the status of the various fish populations and the impact of the fishery on these populations.....	402
To develop, if possible, index fishing stations at which samples of young-of-the-year fish representative of the entire Lake Erie population situation can be taken.....	403
FRASER, J. M. — To measure and describe the scope of normal, year to year changes in natural brook trout populations.....	404
To increase the numbers of brook trout available to anglers by manipulating harvest.....	405
To investigate the possibilities of providing spawning facilities (artificial if necessary) for brook trout to improve success of natural reproduction.....	406
To determine the potential use of fish toxicants in the management of lakes for brook trout.....	407
To investigate the variety of lake environments inhabited by brook trout with a view to developing a useful classification of such lakes.....	408
To investigate the role of white suckers in limiting the survival of planted brook trout in lakes.....	409
To develop a practical stocking-rate formula for types of brook trout lakes in order more efficiently to use hatchery stocks.....	410

LIFE SCIENCES

FRASER, J. M., MACLEOD, J. C., MARTIN, N. V. — Algonquin Park Creel Census — the measurement of the harvest of important game species by anglers in a number of waters annually.....	411
MACLEOD, J. C. — To evaluate the success of planting smallmouth bass fingerlings in lakes already supporting a bass population.....	412
To measure the sub-lethal effects of detergents on smallmouth bass e.g. do they affect reproduction, feeding, respiration, activity?.....	413
To study the factors involved in the production of eggs, fry and fingerling smallmouth bass, with a view to determining how summer temperatures influence year class size in Lake Opeongo.....	414
To determine the factors influencing the growth of smallmouth bass during their first year of life and to determine their effect on the ability of bass to survive their first winter....	415
MAHER, F. P., FRY, F. — To locate and describe the stocks of fish present throughout such areas as South Bay, Georgian Bay, and North Channel on an intermittent basis using standard gangs of experimental gill nets.....	416
MAHER, F. P., LOFTUS, K. H. — An experiment to attempt the establishment in Lake Huron of Kokanee, a land-locked variety of sockeye salmon, as a new species for commercial and sport fisheries.....	417
MAHER, F. P., FRY, F., SMITH, J. — To describe the survival, growth and life history of splake (hybrid between lake trout and brook trout) planted in various parts of Lake Huron.....	418
MARTIN, N. V. — To compare plankton-feeding with fish-feeding lake trout in terms of growth rate, age at maturity, population stability, egg production, quality of fishing produced, and management techniques necessary.....	419
To discover the reasons for the poor survival of hatchery-reared yearly lake trout when planted in lakes, e.g. Opeongo, of the Laurentian Shield. The role of soft water vs hard water is now being investigated.....	420

LIFE SCIENCES

MARTIN, N. V., JERMOLAJEV, E. — To study the very early life history and ecology of lake trout to discover whether this stage is important in determining the numbers of lake trout in a population from year to year.....	421
McCOMBIE, A. M. — To study the plant plankton of the Bay of Quinte, Lake Ontario and to make qualitative comparisons with 1945 data with a view to determining the effects of and rate of eutrophication (aging, enrichment).....	422
To study specific physical (temperatures, seiches, currents) and chemical (oxygen, hardness, pH, etc.) conditions of waters in relation to areas and times specified as important to particular fisheries problems.....	423
McCOMBIE, A. M., LOFTUS, K. H. — To provide liaison in fisheries interests with the Great Lakes Institute, University of Toronto, in respect to the support provided for that agency in its hydrographic research on the Great Lakes.....	424
RYDER, R. A. — To prepare an annotated bibliography on walleyes and on closely-related North American species.....	425
To describe the ecology of walleyes in a lake typical for walleyes in Ontario to provide an improved basis for management of the species.....	427
To study the horizontal and vertical variations of total dissolved solids and total alkalinity during the open water period in an oligotrophic (young) lake.....	428
To discover and describe a practical index or indices that will be useful in predicting the fish production potential of lakes.	429
RYDER, R. A., DEWAR, J. E., MARTIN, N. V. — To study the suitability of the Arctic Grayling as a sports fish in Ontario.	430

ONTARIO RESEARCH FOUNDATION

Department of Organic Chemistry

REID, S. G., LADELL, J. L. — Study of morphology of plants, particularly trees.....	431
---	-----

Department of Applied Microbiology

CAMPBELL, L. A. — Investigation into the possibility of applying the microbiological techniques of continuous culture to the purification of municipal sewage.....	432
--	-----

LIFE SCIENCES

CAMPBELL, L. A., SIERRA, G. — Study of enzyme-induced germination of bacterial spores.....	433
CAMPBELL, L. A., SMITH, D. K. — The toxic action(s) of ozone on sewage and water micro-organisms.....	434

Department of Parasitology

ANDERSON, R. C. — Life history and pathology of lungworms of deer and moose.....	435
BENNETT, G. F. — Transmission, specificity and development of avian trypanosomes.....	436
FALLIS, A. M., BENNETT, G. F. — Attraction of black flies to odours and other stimuli.....	437
Malaria-like parasites of birds, their transmission, development and effects on game and domestic birds.....	438
FREEMAN, R. S. — Life histories of tapeworms of trout.....	439
WRIGHT, K. — Development of eggs of certain parasitic nematodes. Structure of muscle system of parasitic nematodes in relation to their movements.....	440
	441

ONTARIO WATER RESOURCES COMMISSION

Research Division

HARRIS, A. J., CHRISTIE, A. E. — Pesticide degradation by algae....	442
HARRIS, A. J., CHRISTIE, A. E., JOHNSON, M. G. — Primary productivity of algae in Ontario lakes.....	443
HARRIS, A. J., NEIL, J. H. — Ecology of cladophora with application to control.....	444

PHYSICS

VIII

DEPARTMENT OF AGRICULTURE

MacDonald Institute

RICHARDS, H. R., FRANK, MISS G. C. — Torsional rigidity of fibres.	445
Static electricity in textiles.....	446
Effect of radiation on fibres.....	447

DEPARTMENT OF THE ATTORNEY GENERAL

Attorney's General Laboratory

ANDERSON, E. J., KRCMA, V. — Forensic identification notes on military rifles and light machine guns.....	448
KRCMA, V. — Czech handguns.....	449
Weapons serial numbering system.....	450
Research into design features of submachine guns (of all countries) which influence identification factors on fired bullets and cartridge cases.....	451
KRCMA, V., OLSEN, L. — Cocking and loading indicators on semi-automatic pistols.....	452
NICHOL, R. C., KRCMA, V. — Forensic identification of firearms — rifled 8/R.....	453
SUTHERLAND, W. W., KRCMA, V. — Recovery methods for fired bullets.....	454

HYDRO-ELECTRIC POWER COMMISSION OF ONTARIO

Research Division

CASSAN, J. G. and HOGG, A. D., ATTRI, N. S., EDGAR, J. N. — Dynamic response of bus-bar systems under short-circuit forces.....	455
HOGG, A. D., EDWARDS, A. T. — Investigation of nature and control of vibration of overhead power transmission conductors.....	456
Study of inter-conductor movements in bundle-conductor systems.....	457

PHYSICS

SUGGITT, J. W., CORDINGLEY, D. C. — Development of new test methods for determining the heat conductivity of thermal insulating materials.....	458
Study of high-temperature insulating materials for thermal generating stations.....	459
VANDERLECK, J. M., IWANUSIW, I. W. — Development of a device for measuring heat-flow across an interface.....	460

ONTARIO RESEARCH FOUNDATION

Department of Materials Chemistry

ARMSTRONG, W. N. B., PERLUS, T. G. — Correlating objective instrumental colour differences with subjective colour difference appreciation on a paint-industry wide basis.....	461
---	-----

Department of Physics

SCHUMACHER, B. W. — High-altitude gas density gauge based on single scatter of electrons.....	462
SCHUMACHER, B. W., GRODZISZEWSKI, J. J. — Photo-electron counter.....	463
SCHUMACHER, B. W., RUMSEY, K. — Electron microprobe and atmospheric electron gun.....	464
SCHUMACHER, B. W., GRODZISZEWSKI, J. J., PRANKEVICIUS, A. — Scanning microscope.....	456

Department of Engineering and Metallurgy

CAVANAGH, R. L., MARTIUS, U., NISKANEN, E. — X-ray services—development and application of specialized analytical X-ray techniques.....	466
---	-----

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RESEARCH INDEX ONTARIO • 1966



AGRICULTURE
CHEMISTRY
EARTH SCIENCES
ENGINEERING
FORESTRY
LIFE SCIENCES
PHYSICS

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1966 RESEARCH INDEX

Projects being carried on
within Ontario Government
Departments and Agencies,
and in a number of
Companies operating in
Ontario in

AGRICULTURE
CHEMISTRY
EARTH SCIENCES
ENGINEERING
FORESTRY
LIFE SCIENCES
PHYSICS

FOREWORD

This second edition of the Ontario research index has realized one of the hopes expressed in the 1965 edition, namely, the inclusion of significant projects currently being pursued by the industrial sector. An invitation to industry to participate resulted in the submission of 97 projects from 20 companies with research and development operations in Ontario.

The purposes of the Index, which have governed its compilation and format, remain the same. These are briefly:

"to assist those responsible for decisions regarding research policy and funding to discover which areas of research are being actively investigated and where there may be gaps." and;

"to facilitate communication between those engaged in research and those who can put their findings into practical economic form."

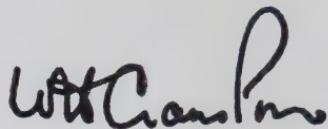
It should be noted that the number of projects listed under a particular discipline does not necessarily indicate the degree of activity in that discipline. Many responders have, quite helpfully, grouped many similar investigations under one project heading. Agriculture, for example, there are actually 407 current projects although a superficial look would indicate 48.

As in the first edition, the very large contribution of University research is not included since this can be determined from the publications of the National Research Council. Similarly, we have continued to restrict the submissions to those fields of investigation which are presently of most interest to industry. The absence of Architecture, this year, is due to the fact that no replies were recorded in this category.

The Ontario Economic Council is most appreciative of the favourable comment on and unexpectedly large number of domestic and foreign requests for the 1965 Index which indicate the usefulness of this activity. It also wishes to acknowledge the excellent cooperation received from all Departments and

Agencies of Government and the research directors of companies who have made this a more useful compilation.

We will welcome any suggestions for future revision or expansion.

A handwritten signature in black ink, appearing to read "W.H. Thompson".

December, 1966.

Chairman.

CONTENTS

	PAGE
Foreword.....	3
Index of Departments, Agencies and Companies.....	7
Index of Principal Investigators.....	11
Subject Index.....	16
Directory of Projects.....	31
AGRICULTURE	
Projects 1-47.....	31
CHEMISTRY	
Projects 49-104.....	39
EARTH SCIENCES	
Projects 105-114.....	47
ENGINEERING	
Projects 115-0323.....	51
FORESTRY	
Projects 318-341.....	69
LIFE SCIENCES	
Projects 342-416.....	73
PHYSICS	
Projects 417-436.....	83

INDEX OF DEPARTMENTS, AGENCIES AND COMPANIES

Department of Agriculture

- Horticultural Experimental Stations 1-7
- Horticultural Products Laboratory 8-15
- Kemptville Agricultural School 16-26
- Ontario Demonstration Farm 047
- Western Ontario Agricultural School and Experimental Farm 27-43

Department of the Attorney General

- Attorney General's Laboratory 105, 342, 343

Department of Energy and Resources Management

- Energy Branch 106

Department of Highways

- Materials and Testing Division 139-159
- Research Branch 121-138
- Road Design Division 115-117
- Traffic and Planning Studies Division 118-120

Department of Lands and Forests

- Fisheries Research Branch 349-397
- Forestry Research Branch 318-341
- Wildlife Research Branch 344-348

Department of Mines

- Mines Inspection Branch 252

Department of Transport

- 0259

Hydro-Electric Power Commission of Ontario

- Research Division 44, 49, 50, 107, 108, 160-251, 417-420

Ontario Research Foundation

- Department of Applied Microbiology 398, 399
- Department of Engineering and Metallurgy 253-258, 421, 422
- Department of Industrial Biochemistry 51, 52
- Department of Materials Chemistry 53-65
- Department of Organic Chemistry 66-73, 400
- Department of Parasitology 401-406
- Department of Physical Chemistry 74-79
- Department of Physics 423-426
- Department of Physiography 45, 46, 109, 110
- Department of Textile Research 80, 81

Ontario Water Resources Commission

- Research Division 111, 259-263, 407-416

INDUSTRIAL RESEARCH

- Atlas Steels Company 264-269
- Canadian General Electric Company Limited 270-276
- Consolidated Mining & Smelting Company of Canada Limited 47, 82, 83, 277-288
- DeHavilland Aircraft of Canada Limited 289, 290, 291, 427-431
- Dilworth, Secord, Meagher & Associates Limited 292-295, 432
- Duplate Canada Limited 84, 85, 433
- EDO (Canada) Limited 434
- Eldorado Mining & Refining Limited 86-89
- Electric Reduction Company of Canada Limited 90, 91, 92
- Ferranti-Packard Electric Limited 296-304
- Garrett Manufacturing Limited 305, 306, 307
- Huntec Limited 112, 113, 114
- Litton Industries 308, 309
- Mallory Battery Company of Canada Limited 93
- Marsland Engineering Limited 310-314
- Proctor & Gamble Company of Canada Limited 94, 95
- Sinclair Radio Laboratories Limited 0318-0323
- Union Carbide Canada Limited 97-104, 315, 316, 317
- Warner-Lambert Research Institute of Canada Limited 96
- Welwyn Canada Limited 435, 436

ADDRESSES OF PARTICIPATING COMPANIES

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INDEX OF PRINCIPAL INVESTIGATORS

This list is compiled in accordance with the returns submitted by the various research groups. The names appearing here are those to whom further enquiries regarding specific projects should be addressed. It will be noted that there is a great variation in the listing of associated research personnel in the body of the index. This probably reflects the variation of practice within the different departments and agencies. The editors have not attempted to impose any arbitrary criteria in this matter though they feel that some uniformity would be desirable in the future.

Adams, A. M.....	8, 9
Adams, J. I.....	107, 160-166
Adhav, R. S.....	434
Archibald, J. A.....	1-4
Armstrong, A. S.....	310
Armstrong, W. N. B.....	53-65
Atherton, D. L.....	296
Atkinson, B. W.....	305
Baldwin, C. S.....	27
Barrett, C. M.....	252
Bata, G. L.....	97-104, 315-317
Bateson, S.....	84, 85, 433
Beckwith, A. F.....	318
Belak, M. J.....	297
Bell, R. C.....	47, 82, 83, 277-281
Bennett, G. F.....	401
Berst, A.....	349-352
Billington, I. J.....	292, 293, 432
Black, S. A.....	111, 260, 261
Bohdanowicz, A.....	298
Boyko, B. I.....	262
Bradstreet, B. J.....	270, 271
Bremner, G. F.....	294
Brooks, G.....	342
Brown, D. M.....	45, 109
Brown, R. H.....	28-31
Buckles, F. G.....	0318, 0319
Butler, J. D.....	047
Cameron, A. W. W.....	167-184
Campbell, L. A.....	398, 399

Carmichael, A. J.	319
Carson, R. O.	264
Cassan, J. G.	185–196, 417
Cavanagh, R. L.	253–258, 421, 422
Chapman, L. J.	110
Chojnacki, B.	121–123, 139
Chong, G.	124
Christie, A. E.	408–412
Christie, W. J.	353–359
Clair, E. G.	105
Class, R. E.	16, 17
Clendenning, T. G.	197–206
Coble, D.	360–362
Corkill, J.	140, 141
Crowther, R. F.	10
Cucin, D.	363
Curtis, J. D.	32, 33
Dalrymple, J. A.	18, 19
Das, B. S.	66
Davis, H. J.	299
Dechtiarenko, A.	364, 365
Donoghue, L. A.	42, 43
Duggal, A. N.	125
Dunikowska, Z.	126
Ellis, J. R.	272
Evans, E. V.	347
Faber, D.	366
Fallis, A. M.	402, 403
Farren, D. W.	115–117
Felch, R. E.	46
Ferguson, R. G.	367–371
Field, F.	145
Fitzgerald, G. W. N.	207
Fitzsimmons, F. E.	295
Forster, J. L.	118
Fowler, D. P.	320
France, T. H.	34
Francis, T.	74
Fraser, J. M.	372–379

Freeman, R. S.	404
Fromm, H. J.	127-129
Fylie, A.	344
Gardiner, J. S.	20
Goodings, A. C.	80, 81
Gordon, A. G.	321-324
Griff, H. K.	21
Guillaume, F.	263
Gupta, R.	343
Haddow, W. R.	325
Harmelink, M. D.	130, 131
Harris, A. J.	111, 259-263, 407-416
Harrison, D.	49, 108, 208-210
Henry, W. C.	51, 52
Hepburn, R. L.	345
Hickling, C. D.	306
Hills, G. A.	326
Hogg, A. D.	211-218, 418, 419
Holowacz, J.	327-330
Hughes, H.	67
Hutchins, R. W.	112, 113
Irvine, O. R.	22, 23
Jacobsen, R. C.	219, 220
Johnson, M. G.	413
Jones, J. N.	311
Jones, M. H.	75, 76
Keil, C.	300
Kelly, F. J.	93
Kerr, E. A.	5-7
Knight, D.	265
Kolenosky, G.	346
Kydd, J.	308
Ladell, J. L.	68, 400
Larsson, H. C.	331-335
Leech, R. H.	336
Leeson, F. D.	312
Leslie, A.	132
Leslie, J. R.	221-228

Lewis, D.	309
Lo, K. Y.	142
Lomas, H.	69, 70
Luckham, D. G.	35, 36
Lumb, G.	96
Lumsden, H. G.	347
Lyon, N. F.	337
MacDonald, J. A.	37, 38
Maher, F. P.	384, 385
Maine, A. E.	289–291, 427–431
Marsland, L. H.	313
Martin, N. V.	386–388
Marton, J. P.	435, 436
Matolcsy, G.	71
McAdie, H. G.	77, 78
McCombie, A. M.	389–391
McGilverty, J. D.	90–92
McLaren, A. D.	39, 40
McLean, M. M.	338
McLeod, J. C.	380–383
Melvanin, F. W.	86
Miller, G. F.	273
Mulhall, V. R.	274
Mullin, R. E.	339
Oksiutik, G.	0320
Osborne, H.	301
Palmer, A.	266
Paterson, N. R.	114
Phang, B.	143
Phang, W.	144, 145
Pollock, F. E.	94, 95
Raymond, F. L.	340
Reckahn, J.	392
Richardson, R. J.	307
Ritcey, G. M.	87
Ryder, R. A.	393–397
Ryell, J.	146, 147
Schonfeld, R.	133–135
Schumacher, B. W.	423–426

Scrimgeour, J.	275, 276
Secord, A. H.	0321, 0322
Sefton, V. B.	79
Seth, B.	267, 268
Sharp, D. A.	106
Shelson, W.	229
Simo, E.	302
Simpson, F. J.	230-239
Sinclair, G. A.	341
Skepasts, A. V.	24, 25
Smart, B. C.	88
Smith, P.	148-153
Sowa, W.	72
Stein, A.	309
Stephenson, A. B.	348
Stermac, A. G.	154-157
Stinson, F. A.	26
Suggitt, J. W.	44, 50, 240-249, 420
Suter, A. C.	158
Syer, M.	11, 13
Tamberg, K. G.	136, 137
Taylor, M. K.	303
Thomas, G. H. S.	73
Tilston, W. V.	0323
Trew, J. S.	119, 120
Truscott, J. H. L.	12, 13
Tyler, A. R.	304
Vajdic, A. H.	414, 416
Vanderleck, J. M.	250, 251
Vincent, P. T.	159
Wade, P. E.	0259
Walker, R. W.	314
Wellington, J. R.	282-288
Whittaker, D. A.	269
Winfield, R. G.	41
Wolfe, R. I.	138
Wright, K.	405, 406
Zawidzki, T. W.	89
Zubeckis, E.	14, 15

SUBJECT INDEX

The principal investigators were asked to classify each of their projects under one or two titles selected from a list of "fields of investigation". These general classifications will be found below (e.g. Analytical Chemistry, Electrical Engineering, Parasitology) together with a listing of projects under descriptive words also supplied by the investigators (e.g. Herbicides, Polymers, Power Transmission, Pavements). In addition the editors have selected certain key words from the detailed description of the projects which specify the object or material on which the research is being done (e.g. corn, concrete, iron, paper, sweet potatoes, etc.).

Because certain investigations are of particular interest to a definite region of Ontario, studies of this sort have been additionally indexed under their regional designation (e.g. Georgian Bay, Lake Ontario, Northern Ontario, Ottawa River, etc.).

By arranging these four categories of description in one alphabetical list, this Subject Index becomes a convenient cross reference. Each project appears under at least three headings sometimes more.

No attempt has been made to modify the individual preferences as to subject titles appropriate to a project so it has been sometimes necessary to use several listings to cover an entire field of investigation, for example anyone interested in the general field of paving materials should consult the projects listed under Asphalt, Cement, Pavement as well as Test Methods and Measurements.

- Absorption 62, 77
- Acoustics 112, 113, 285, 293, 434
- Adhesion 64, 245
- Aerophysics, Aeronautics and Aeronautical engineering 293
- Agricultural biology 29-31
- Agricultural chemistry 44, 82, 83
- Agricultural engineering 41-43
- Agronomy 29, 24-26, 32, 33, 39, 40, 41, 45, 46
- Aircraft navigation systems 308
- Alcohol 74

Algae 259, 407–409, 412
Algonquin Park 379, 382, 387
Alkaline batteries 93
Alkalinity (total) 395
Alloys 282
Alumina 85
Aluminum alloys 43, 231, 239
Amplifiers 314
Analogue plotting 313
Analytical chemistry 51, 79
Animal husbandry 18, 19, 37, 38, 42, 43, 047
Annuals 16
Apples 7, 16, 28
Applied mathematics 114, 163, 229, 275, 276, 278, 279, 280, 300, 340, 371
Apricot 7
Arctic grayling 397
Ash 335
Asphalt and asphaltic concrete 64, 126, 129, 140, 143–145
Atomic and molecular physics 51

Bacteria 9, 414
Barley 19, 25, 32
Bass (small mouth) 361, 380–383
Basswood (American) 335
Batteries (alkaline) 93
Bay of Quinte 353, 357, 389
Beans 25, 33, 39
Bear (black and polar) 346
Beaver 348
Beets 39
Beef cattle 37, 38, 43, 047
Bismuth 295
Black cherry 332, 335
Blackfly 70, 402
Bleaching agents 90
Blowing agents 76
Bolometer 290
Botany 400, 407–412
Bridges 136, 137, 141, 149
By-product utilization 92

- Cables 167, 170, 191, 193, 219, 224, 248, 252
Canning 13
Carbohydrates 72–73
Caribou 345
Casting (continuous) 265, 283
 (die) 267, 286
Catalysis 52, 77, 97
Cattle (beef and dairy) 18, 37, 38, 42, 43, 047
Cavitation 232, 295
Cellulose 81
Central Ontario 338
Cement (see concrete)
Ceramics 54–56, 63, 84, 85
Cereals 25, 33
Cheese 22
Chemical and Physical properties 50, 53, 54, 57–64, 66–68, 71, 80, 81, 84, 85, 93, 102, 104, 197, 231, 237, 244, 245, 267, 317, 319, 422, 435, 436
Chemical engineering 86, 87, 208–210, 219, 220, 240, 241, 247, 249, 275, 315, 316
Chemical processing 87, 88
Chemisterilants 67
Cherry 7, 332
Chert 126
Chickens 35, 36
Chlorides 159
Chlorine dioxide 90
Chromatography 63, 99, 129
Chrysanthemum 5
Civil engineering 107, 111, 115–166, 197–206, 211, 213, 216, 242–245
Clathrate 78
Clay 154, 155, 161, 162, 164, 165
Clematis 5
Climatology 45, 46, 109
Cochrane Clay Belt 337
Colorimetry 65
Communication system 297
Computer applications 106, 182, 275, 276, 278, 279, 297, 304, 308, 310
Concrete (and cement) 58, 59, 121–123, 126, 129, 139, 141, 146–153, 159, 197, 198, 200–206, 216
Conifers 16, 336

Control systems 275, 276, 305, 307
Corn 6, 25, 31, 39, 40, 41, 45
Corona 190, 274, 298, 300, 302
Corrosion 128, 159, 219, 234, 235, 239, 242, 252, 288
Cottonwood 331, 335
Courtright area 107
Coyote 346
Cream 23
Crop management 26, 27, 31, 33, 40, 46
Cryogenics 296
Crystal chemistry 84
Crystal growth 434
Crystallization 102
Crystallography 421
Cucumber 6
Currant 7

Dairy cattle 37, 38
Diary science 18, 22, 23, 42, 43
Dams 163
Data processing and Information systems 34, 113, 223, 273, 303
DC generators 296
Deer 345
Dessorption 62
Detergents 95, 381
Deterioration 123
Dissolved solids 395
Distribution systems 179, 188
Dolomite 59
Drill rods 264
Drugs 96, 342, 343
Drug stability 342
Dutch Elm disease 331

Ecology—animal 345–348, 388, 394, 413
—forest 321, 323, 326, 337, 341
—plant 45, 407
Eel (American) 356
Elastomers 243, 244

- Electrical conduction 435
Electrical and Electronics Engineering 167–196, 207, 221–228, 231, 248, 250, 251, 272–274, 297, 298, 300–304, 306, 307, 310–314, 316, 0318–0323, 417, 435, 436
Electrochemistry 93, 281
Electrodes 93
Electromagnetic waves and Electron physics 0319, 0320, 0323, 423–427, 430, 435, 436
Electron microscopy 425–426
Electrowinning 281
Entomology 402, 403
Epoxides 75
Eutrophication 389
Explosive reactions 294
Extractive and pyrometallurgy 86
Extrusion 284
- Fabrics 81
Farm structures 42, 43
Fatigue resistance 267
Fats, and Fatty acids 51, 52, 94
Ferroelectrics 84
Fertilizers 4, 20, 27, 47, 83, 91, 92, 336
Fibres 71, 80, 81, 238
Field crops 27, 29
Films 304, 435, 436
Fire prevention 249
Fisheries 349–397
Fish, planted 349, 376, 380
Fish stock and populations 353–359, 361–372, 379, 380, 386, 388, 396
Flavour 22, 23, 409
Flight instruments 305, 307, 308
Flotation 277, 280
Fluid flow 294, 295, 432
Fluorides 79, 92
Fluxpumps 296
Foamed plastics 76
Food chemistry 52
Food preservation 11–13
Forage crops 18, 20, 26, 39, 40

Forage management 26, 46
Forest economics 318, 327, 328, 336, 339
Forest management 47, 339, 341
Forest mensuration and statistics 318, 336, 340
Forest products 329, 330
Forest surveys and sites 326
Forest tree breeding 320
Forestry and Range science 47, 68, 71, 318–321, 325–327, 331, 337–341, 400
Foundations 162, 213
Freezing 13
Fruit 1, 4, 7, 16, 30
Fruit chemistry 15
Fruit products 11
Fruit processing 13
Fruit syrups, etc. 14
Fruit storage 12
Fuel cells 299
Fungicide 17
Fur-bearers 348
Galvanizing 287
Geese (Canada) 347
Generators 169, 176, 178, 180
Genetics (animal) 047
Geochemistry 105
Geology 105–107, 110
Geophysics 112–114
Georgian Bay 110
Germanium dioxide 53, 54
Glacial deposits 107, 110
Gladiolus 5
Glass 53, 55, 56, 63, 433
Grape 7
Grass 26
Great Lakes 391
Grouse (ruffed and prairie) 347
Growth-regulating chemicals 1, 44
Gypsum 57, 60, 199
Hair 80

- Hard maple 332, 335
Heating (electric) 42, 192, 194
Heat transfer 315
Herbicides 17, 334
High-pressure kinetics 98
Highway standards and design 115–117, 130, 133–135, 153, 154, 156, 158
Holly 5
Horticulture 1–17, 21, 28, 30, 47
Hot-pressing 89
Hydraulic engineering 217, 218
Hydrazides 74
Hydro carbons 102
Hydrogenation 52
- Illumination 117, 185
Inclusion compounds 78
Induced polarization 114
Infra-red spectra and spectrometers 49, 51, 226, 289, 290
Inorganic chemistry 53, 54, 57, 58, 63, 77, 84–91
Insect attractants 70
Insecticide 17
Instrument design, development, and evaluation 65, 79, 264, 289, 290, 296, 297, 299, 301, 303, 305–307, 310–314, 423–426
Insulation
 electrical 49, 168–172, 196, 208, 210, 274, 298, 300, 302, 316
 thermal 296, 420
 oil 49, 210, 298
Inverters 306
Iron (and iron ore) 253, 255–257
Isocyanates 74
- Joints 121, 122, 148, 150, 243
- Kokanee 359, 384, 392
- Lake Erie 109, 364, 367–371
Lake Huron 109, 361–363, 366, 384, 385, 392
Lake Ontario 353–359, 389, 394
Lamprey 354
Lasers 427, 433

- Lead 282, 283, 285, 288, 295
Lead metaniobate 84
Legumes 26
Lighting and electrical surges 173, 175–177, 181, 183, 184
Lily 5
Limnology 111, 389–391, 395, 396, 407, 411–413
Liquid metals 295
Liquid seals 292
Lithium—cesium 56
Lubrication 75, 209, 315
- Magnetism 296, 422
Manure 43
Maple 331–333, 335, 338
Maple syrup 333
Mathematics (see Applied Mathematics)
Measurements and test methods 96, 160, 161, 178, 180, 183, 191, 196, 199, 207, 224, 237, 238, 249, 251, 252, 258, 272, 298, 3018, 432
Mechanical engineering 195, 212–215, 217, 218, 230, 236–238, 245, 246, 275, 276, 292, 310, 312, 313, 315, 317
Mechanics 211, 212, 214, 215, 217, 218, 230, 231, 417, 419, 433
Metallurgy and Metallurgical engineering 86, 219, 220, 231–235, 239, 253, 255–258, 264–271, 277, 281–284, 286–288, 422
Metals 231, 247, 255
Metals (fatigue) 214, 230, 258
Meteorology 108, 109
Microbiology 8, 9, 398, 399, 414–416
Micro-climate 2
Microwave lenses 430
Milk 23
Minerals separation 257
Mining and petroleum engineering 276, 280
Molecular sieves 77
Monomers 103
Moose 345
Motors (electrical) 179
Myoelectric devices 309
- Navigation systems 308
Nematodes 405, 406

- Noise control 285, 301
Northern Ontario 151, 320, 337
Nuclear engineering 294, 295
Nuclear magnetic resonance 73
Nutrients and Nutrition
 animal 35–37
 plant 4, 321, 322, 324, 336
- Oak 332
Oats 25, 32
Odours 409, 415
Oils 24, 49, 50, 52, 94, 170, 208–210, 302
Ontario 45, 68, 106, 325, 365, 394, 412
Optics 65, 433
Ore bodies 114
Organic chemistry 49, 50, 62, 66, 67, 69, 70, 72–74, 76, 81, 94, 95, 103, 104, 208, 240, 241
Organic coatings 61, 62
Organo-silicon 66
Ornamental crops and plants 4, 5, 16
Ottawa River 110
Otter 348
Ozone 399
- Paint 61, 62, 65
Parasites,
 birds 401–403
 fish 364, 365, 404
 wildlife 344, 402
Parasitology 70, 344, 364, 365, 401–406
Pathology 344, 403
Pavement 121, 124, 127, 128, 134, 140, 143, 150, 152, 153, 158
Pavement sealing 121, 122
Peaches 7, 28
Pear 7
Peppers 6
Perch (white and yellow) 355, 360
Pesticide 21, 67, 408
Pharmacy and pharmacology 342, 343

Phosphates 63, 82, 91, 92
Phosphoric acid 91
Physical and chemical properties 50, 53, 54, 57–64, 66–68, 71, 80, 81, 84, 85, 93, 102, 104, 197, 231, 237, 244, 245, 267, 317, 319, 422, 435, 436
Physical chemistry 78, 84, 85, 87, 97–100, 102, 317
Physiology
 fish 404
 plant 1–3, 408, 409, 412
Piezoelectricity 434
Piles 142, 155, 157, 164, 219
Pine 336
Pipes and tubes 246, 294
Plankton 386, 389, 410, 411
Plant breeding 5–7
Plant morphology 400
Plaster 60, 199
Plastics 76, 101, 243, 244, 246, 248, 249, 316
Pleistocene 110
Plum 7
Pollution
 air 79, 108
 water 111, 259–261, 408, 410, 415, 416
Polydispersity 99
Polyethers 315
Polymers and polymerization 75, 97–101, 103, 317
Polyurethanes 101
Poplar 320, 332
Potatoes 6, 28
Poultry science 35, 36
Power distribution 167, 174, 177
Power sources, supplies 93, 306
Power systems 175, 182, 184, 187, 211, 221, 222, 227–229, 419
Power transmission 170, 173, 174, 176, 178, 181, 183, 186, 188–191, 193, 195, 225–231, 296, 418, 419
Predators and predation 345, 346, 348
Preservatives 240–242
Probability and Statistics 229
Protein requirements 36
Pulp and Paper 68, 71, 275
Purification 398

- Radiation detection and measurement 423, 424
Reaction kinetics 98, 100
Read oak 332
Red pine 336
Reforestation 339
Resins 50
Rhododendron 5
Ropes 238, 252
- Salt 128
Sand 151, 162
Sanitary engineering 259–263
Sealing joints 121, 122, 243, 292
Sedatives 343
Seismology 112, 113
Selective breeding (fish) 352
Sewage 111, 259–263, 398, 399, 410
Shafts 292
Silage 43
Silica 92
Silver maple 331, 335
Silvicides 334, 341
Silviculture 325, 331–338, 341
Simulators (sonar) 312
Smelt 364, 367–369
Smelting 253
Soaps 95
Sodium chlorate 90
Sodium fluoride 414
Sodium phosphate 55
Soil fertility 4
Soil mechanics 160, 164–166
Soil science 20, 21, 27
Soil sterilants 334
Soils 105, 142, 160
Solid state 84, 85, 89, 307, 314, 422, 427–429, 431, 434–436
Sonar 312
Southern Ontario 341
Soybean 25, 32, 33
Space applications, and elements 291, 429

- Spectrometer 289
Splake 350, 351, 385
Spoilage bacteria 9
Spruce 320-324
Stability 156, 163, 236
Steam 294
Steel 159, 242, 270-272
—alloy 264, 269
—stainless 233, 266
—tool 268
—welds 270, 271
Strawberry 7
Strength of materials 237
Stress analysis 215, 433
Suckers 360, 376
Sugar beets 39
Sugar maple 333, 338
Sulphonamides 74
Sulphur dioxide 108
Sunflowers 24
Superconductor 304
Surface-active agents 69
Surface preparation 247
Surface properties 429
Sweet potatoes 6
Swine 19, 37, 38, 42
Syrup 333
- Talus slopes 156
Telephone (field) 311
Telomerization 100
Test methods and measurement 96, 160; 161, 178, 180, 183, 191, 196, 199,
207, 224, 237, 238, 249, 251, 252, 258, 272, 298, 0318, 432
Textiles 80, 81
Thermal phenomena 269, 299, 307, 315, 420, 433
Thermal properties 195, 231, 420
Timber 318, 326
Tomatoes 6, 28
Toxicity and Toxicants 96, 233, 343, 375, 381, 399
Traffic control and studies 118-120, 125, 131, 136-138, 0259

- Transformers 176, 178, 250, 298, 301, 302, 306
Transition metals 97
Transportation planning 0259
Trout 349, 376, 404
—brook 372-378
—hybrid 350, 351, 385
—lake 354, 386-388
Tubes and Pipes 294
Turbines 217, 218, 293
Ultrasonic applications 254, 271, 434
Underwater sound 112, 113
Uranium 88, 255
Urea 104
Vegetable crops 1, 4, 6, 30
Vegetable products 11
Vegetable storage 12
Vegetable processing 13
Ventilation 42
Vibrations 212, 418, 419
Viruses 416
Walleye 357, 393, 394
Water
—heating 194, 220, 294
Water fowl 347
Weed control 29, 30
Welding 233, 270, 271
Wheat 25, 32
White ash 335
Whitefish 353, 363, 366
White pine 320, 325
Wildlife 344-348, 401-403
Wines 10
Wire rope 252
Wolf 346
Wood 68, 237, 241, 319
Wool 80
Xanthates 277
X-Ray analysis 421

Yeasts 8

Zinc 61, 281–284, 286, 288

Zirconium metal 86

Zoology 401–406

AGRICULTURE

I

DEPARTMENT OF AGRICULTURE

Horticultural Experiment Stations, Vineland Station, Ontario

ARCHIBALD, J. A., COLLIN, G. H., RICKETSON, C. L., WHITTY, C. D.— Effect of growth-regulating chemicals on fruit and vegetable crops. (4 projects).....	1
ARCHIBALD, J. A., CLINE, R. A., COLLIN, G. H., MERCIER, R. G., RICKETSON, C. L., WIEBE, J.—Effect of micro-climate and other environmental factors on growth and yield of selected horti- cultural crops. (3 projects).....	2
ARCHIBALD, J. A., BRADT, O. A., CLINE, R. A., FLEMING, R. A., FORSTER, R. R., HUTCHINSON, A., WHITTY, C. D., WIEBE, J.—Propagation, pruning, training, spacing, and hardiness studies with horti- cultural crops. (30 projects).....	3
ARCHIBALD, J. A., BRADT, O. A., CLINE, R. A., COLLIN, G. H., FLEMING, R. A., FORSTER, R. R., REISSMANN, H. J., RICKETSON, C. L., WHITTY, C. D., WIEBE, J.—Studies in plant nutrition, soil management, and fertilizer use with fruit, vegetable, and orna- mental crops. (24 projects).....	4
KERR, E. A. FLEMING, R. A., FORSTER, R. R.—Breeding and variety testing of ornamental plants, (6 projects) Rhododendron, holly, lily, gladiolus, clematis, outdoor chrysanthemum.....	5
KERR, E. A., WIEBE, J., COLLIN, G. H.—Breeding and variety testing of vegetable plants (Greenhouse and outdoor tomatoes, sweet corn, greenhouse cucumbers, sweet potatoes, peppers, potatoes)— (20 projects).....	6
KERR, E. A., BRADT, O. A., HUTCHINSON, A., RICKETSON, C. L., WHITTY, C. D.—Breeding and variety testing of fruit plants (apple, pear, cherry, plum, peach, apricot, grape, strawberry, currant) (14 projects).....	7

AGRICULTURE

Horticultural Products Laboratory, Vineland Station, Ontario

ADAMS, A. M. — Yeasts (6 projects).....	8
Spoilage bacteria (3 projects).....	9
CROWTHER, R. F. — Wines (15 projects).....	10
SYER, MARGARET; LANGTON, ANN; TRUSCOTT, J. H. L. — New fruit and vegetable products (12 projects).....	11
TRUSCOTT, J. H. L. — Cold storage of fruit and vegetables (5 projects)...	12
TRUSCOTT, J. H. L., and SYER, MARGARET — Canning and freezing of fruits and vegetables (11 projects).....	13
ZUBECKIS, E. — Fruit juices, concentrates, essences and syrups — (6 projects).....	14
Fruit chemistry — (6 projects).....	15

Kemptville Agricultural School, Kemptville, Ontario

CLASS, R. E., MANSFIELD, J. P. — Variety testing of apples, small fruits, ornamental conifers and annuals. (6 projects).....	16
Fungicide, insecticide, herbicide trials on selected horticultural crops. (8 projects).....	17
DALRYMPLE, J. A. — A study to determine mineral requirements for growing dairy heifers and to determine whether they have a preference as shown by free choice feeding.....	18
DALRYMPLE, J. A., JAMIESON, J. D. — The effect of wet and dry barley on growth, feed efficiency and carcass merit of swine.....	19
GARDINER, J. S., GRIFF, H. K. — Studies in soil management and fertilizer use with forages and cereals. (8 projects).....	20
GRIFF, H. K., CLASS, R. E. — Pesticide residue studies.....	21
IRVINE, O. R. — Flavour defects in cheese. (2 projects).....	22
IRVINE, O. R., BEACH, M. E., BURNETT, K. A. — Control of flavour defect in milk and cream. (2 projects).....	23
SKEPASTS, A. V., Stinson, F. A. — Evaluation of varieties and planting patterns of sunflowers for oil production. (2 projects).....	24

AGRICULTURE

Evaluation and comparison of local adaptation of oats, barley, winter wheat, soybean and white beans varieties and corn hybrids. (16 projects).....	25
STINSON, F. A., SKEPASTS, A. V. — Evaluation and comparison of local adaptation of annual forages, perennial forage legume and grass species, varieties, mixtures, methods of establishment and cutting management. (11 projects).....	26
 Western Ontario Agricultural School and Experimental Farm, Ridgetown, Ontario	
BALDWIN, C. S., STEVENSON, C. K. — Research studies in soil and crop management and fertilizer use with field crops. (20 projects).....	27
BROWN, R. H., MINDREBOE, K. — Variety testing of horticultural crops (fall and spring hothouse tomatoes, potatoes, apples and peaches). (5 projects).....	28
Weed control studies in field crops. (30 projects).....	29
Weed control studies in vegetable and fruit crops. (21 projects)....	30
BROWN, R. H., PREE, David, BALDWIN, C. S. — Studies in the control of the Northern Corn Rootworm in field corn. (7 projects).....	31
CURTIS, J. D., McLAREN, A. D. — Evaluation of lines, strains and varieties of winter barley, winter wheat, spring barley, oats and soybeans. (28 projects).....	32
Studies of production practices involving varieties, row widths, seeding rates, dates of planting, use of growth regulators in soybeans, field beans and cereals. (8 projects).....	33
FRANCE, T. H. — Monthly mail-in data analysis.....	34
LUCKHAM, D. G. — Evaluation of various methods of feeding growing chickens and the effect of laying house performance. (4 projects) Studies of the protein requirements of poultry. (3 projects).....	35 36
MACDONALD, J. A. — An evaluation of various feeds and feed additives in the rations of swine, beef cattle, and dairy cattle. (8 projects) The improvement of production in swine, beef cattle and dairy cattle through selection. (3 projects).....	37 38

AGRICULTURE

MCLAREN, A. D., CURTIS, J. D. — The evaluation of lines, strains and varieties of forage crops, sugar beets, grain corn and field beans. (23 projects).....	39
Evaluation and comparison of cultural practices and management of field corn and forage crops. (9 projects).....	40
WINFIELD, R. G., MACDONALD, J. A. — Evaluation of machines for corn planting and harvesting. (3 projects).....	41
DONOGHUE, L. A., MACDONALD, J. A. — Environment control in hog and dairy barns. (2 projects):.....	42
1. Cost of operation of electric hot water floor heating for hog feeder barn.	
2. Investigation of different design features of ventilation inlets.	
DONOGHUE, L. A., WINFIELD, R. G., MACDONALD, J. A. — Elements of dairy and beef cattle housing. (5 projects):.....	43
1. Farm rib roofing, using a high tensile strength alloy of aluminum.	
2. Feeder beef cattle confined on steel and on concrete floor slats.	
3. Storage and handling of livestock liquid manure.	
4. Cantilever truss pole barn design.	
5. Labour efficiency and automation in silage handling for dairy cattle.	

HYDRO ELECTRIC POWER COMMISSION Research Division

SUGGITT, J. W. — Study of effectiveness of, and application methods for viscous sprays for woody-growth control.....	44
--	----

ONTARIO RESEARCH FOUNDATION Department of Physiography

BROWN, D. M., FELCH, R. E. — Corn ecology — a study of the adaptation of the various hybrids in the different climatic zones of Ontario.....	45
--	----

AGRICULTURE

FELCH, R. E., PETTIT, CLAUDE, BROWN, D. M. — Forage crop management experiment in cooperation with Department of Crop Science, University of Guelph.....	46
(climatological aspect)	
 Ontario Demonstration Farm, New Liskeard, Ontario	
BUTLER, J. D., BOWMAN, G., RENNIE, J.C., STARR, E. — The genetic improvement of beef cattle production, through the use of performance tested sires.....	47
 THE CONSOLIDATED MINING AND SMELTING CO. OF CANADA LTD.	
BELL, R. C. — Forest and range fertilization.....	47

CHEMISTRY

II

HYDRO-ELECTRIC POWER COMMISSION OF ONTARIO
Research Division

HARRISON, D., FERRIE, J. S.—Study of transformer oils in service by infrared spectrophotometry.....	49
SUGGITT, J. W., CORDINGLEY, D. C.—Effect of petroleum oil composition on physical properties of polyethylene resins in contact with such oils.....	50

ONTARIO RESEARCH FOUNDATION

Department of Industrial Biochemistry

HENRY, W. C., KIRBY, Miss E. M.—Infrared spectroscopy of fatty acids	51
HENRY, W. C., LEMON, H. W.—The effect of catalysts and operating variables on selectivity and isomerization during hydrogenation of oils and fats.....	52

Department of Materials Chemistry

ARMSTRONG, W. N. B., MURTHY, M. K.—Structure and properties of glasses based on germanium dioxide.....	53
Crystal chemical studies and phase equilibria in systems containing germanium dioxide.....	54
ARMSTRONG, W. N. B., MURTHY, M. K.—Glass-transition point of sodium-phosphate glasses.....	55
Constitution of lithium-cesium glasses.....	56
ARMSTRONG, W. N. B., KUNTZE, R. A.—The physical chemistry of gypsum and its dehydration products.....	57
False set of Portland cement.....	58
A preliminary study of the suitability of dolomite for the manufacture of Portland cement.....	59
The chemistry of the retardation of gypsum plasters and its effect on their properties.....	60
ARMSTRONG, W. N. B., PERLUS, T. G.—Durability of organic zinc-rich coatings.....	61

CHEMISTRY

ARMSTRONG, W. N. B., PERLUS, T. G. — A study of the absorption and desorption processes of organic coatings exposed to various agents	62
ARMSTRONG, W. N. B., WESTMAND, A. E. R., MURTHY, M. K. — Structure constitution and properties of condensed phosphates using paper and ion exchange chromatography.....	63
ARMSTRONG, W. N. B., KUNTZE, R. A., BROWN, E. C. — Correlation between chemical composition and adhesive properties of asphalts.....	64
ARMSTRONG, W. N. B., PERLUS, T. G. — Correlating objective instrumental color differences with subjective color difference appreciation on a paint industry wide basis.....	65

Department of Organic Chemistry

DAS, B. S. — Chemistry of organo-silicon compounds.....	66
HUGHES, H. — Chemistry of pest-control chemicals particularly chemisterilants.....	67
LADELL, J. L., BRAJAS, MISS B., THOMAS, G. H. S. — Study of properties of wood grown in Ontario and the relation of these properties to end uses of wood, particularly pulp and paper.....	68
LOMAS, H. — Chemistry of organic surface-active agents..... Chemistry of black fly attractants.....	69 70
MATOLCSY, G. — Study of relationship of fibre characteristics and properties of paper.....	71
SOWA, W. — Synthesis of new carbohydrates.....	72
THOMAS, G. H. S. — Study of carbohydrates by nuclear magnetic resonance (NMR).	73

Department of Physical Chemistry

FRANCIS, T. — Study of the reactions of isocyanates with alcohols, sulphonamides and sulphonyl hydrazides.....	74
JONES, M. H., CHOW, D. — Synthesis of fluorinated epoxides as starting materials for the preparation of fluorinated polyethers-potential high temperature lubricants.....	75
JONES, M. H., FRANCIS, T. — Synthesis of organic chemical blowing agents with novel properties for use in foamed plastics.....	76

CHEMISTRY

MCADIE, H. G. — Preparation of new materials with lattice structures of the molecular sieve type as potential absorbants and catalysts	77
Study of the properties and structure of inclusion compounds of the urea and quinol clathrate types.....	78
SEFTON, V. B. — Development of a continuous analyser for atmospheric fluorides.....	79

Department of Textile Research

GOODINGS, A. C. — Structural modification of wool and hair to exploit changes in the fibre which can be induced chemically, with particular reference to rigidity and ease of extension.....	80
GOODINGS, A. C., STAPLES, M. L., CAMPBELL, H. J. — Chemical modi- fication cellulosic fibres to improve existing properties of fabrics, with particular reference to crease resistance qualities (wash-wear properties).....	81

THE CONSOLIDATED MINING AND SMEILING CO. OF CANADA LTD.

BELL, R. C. — Evaluation of phosphate rocks (laboratory and pilot plant studies).....	82
Caking of fertilizers (including fertilizer conditioner improvements). .	83

DUPULATE CANADA LTD., OSHAWA

BATESON, S., FICKERT, K. W. J., URBAN, P. — Ferroelectric ceramic mate- rials based on lead metaniobate.....	84
BATESON, S., KAPPES, K., LOMELAND, E. — Alumina ceramic materials	85

ELDORADO MINING AND REFINING LTD.

MELVANIN, F. W., CRAIGEN, W. J. S., McCCLURE, R. J., JOE, E. G. — Production of ductile zirconium metal from zircon sand.....	86
RITCEY, G. M., ASHBROOK, A. W., BROOKE, K. W. — Production of elec- tronic raw materials by chemical processing methods.....	87

CHEMISTRY

SMART, B. C., WILKINSON, R. W. — Improved production methods for various uranium compounds.....	88
ZAWIDZKI, T. W., BROWN, A. G. L. — Hot pressing investigations.....	89

ELECTRIC REDUCTION COMPANY OF CANADA LTD.

McGILVERY, J. D. — Investigations on the preparation and commercial exploitation of bleaching agents such as sodium chlorate and chlorine dioxide.....	90
Investigations on the purification of wet-process phosphoric acid to render it suitable for industrial use.....	91
Investigations on the utilization of by-product fluorides, silica and various phosphates from fertilizer manufacturing operations.....	92

MALLORY BATTERY COMPANY OF CANADA LTD.

KELLY, F. J., PRZYBYLA, F. — Low temperature characteristics of alkaline primary (electro-chemical) systems	93
---	----

THE PROCTER AND GAMBLE COMPANY OF CANADA LTD.

POLLOCK, F. E. — Technology of edible fats and oils.....	94
Technology of soaps and synthetic detergents.....	95

WARNER-LAMBERT RESEARCH INSTITUTE OF CANADA LTD.

LUMB, G. — Research into improved toxicology methodology for safety and efficacy of new drugs.....	96
--	----

UNION CARBIDE CANADA LTD.

Chemicals and Resins Division

BATA, G. L., HAZELL, J. E. — Transition metal complex catalysts in ionic polymerization.....	97
High pressure polymerization kinetics.....	98

CHEMISTRY

BATA, G. L., HAZELL, J. E., PRINCE, L. A. — Polydispersity determinations by chromatographic techniques.....	99
BATA, G. L., PORTER, B. R., FARRELL, P. C. — Telomerization processes	100
BATA, G. L., PORTER, B. R., HENDERSON, E. A. — Polyurethane plastics	101
BATA, G. L., SINGH, K. P. — Crystallization rates of hydrocarbons....	102
Free radical copolymerization of non-vinyl-type monomers.....	103
BATA, G. L., SINGH, K. P., ANDREJCHYSHYN, W. M. — Chemistry of cyclic urea derivatives.....	104

EARTH SCIENCES

III

DEPARTMENT OF ATTORNEY GENERAL

Attorney General's Laboratory

- CLAIR, E. G., FRENKEL, O. — Differentiation of soils for forensic purposes..... 105

DEPARTMENT OF ENERGY RESOURCES AND MANAGEMENT

Energy Branch

- SHARP, D. A., BRIGHAM, R. J.¹ — Ontario Well Data Computer Projects 106

HYDRO-ELECTRIC POWER COMMISSION

Research Division

- ADAMS, J. I., HANNA, T. H. — A detailed study of the geological history, structure, and engineering properties of the post-glacial lake deposits near Courtright, Ontario..... 107

- HARRISON, D., KERRY, C. W. — Comparison of calculated and measured concentrations of sulphur dioxide at ground level, due to emission from a point source..... 108

ONTARIO RESEARCH FOUNDATION

Department of Physiography

- BROWN, D. M., CHAPMAN, L. J. — Climate of the areas bordering Lake Erie and Lake Huron..... 109

- CHAPMAN, L. J., HILL, W. B. — Mapping glacial features and deposits in the area between Georgian Bay and the Ottawa River 110

ONTARIO WATER RESOURCES COMMISSION

Research Division

- HARRIS, A. J., BLACK, S. A. — Sewage effluent diffusion in large bodies of water..... 111

¹ University of Western Ontario.

EARTH SCIENCES

HUNTEC LIMITED, TORONTO

HUTCHINS, R., MAU, A., MEIDAV, T., MILLAR, R. A., DIETER, K.— Under-water seismics ¹	112
HUTCHINS, R., MEIDAV, T., DIETER, K.—Seismic signal processing ² ..	113
PATERSON, N. R., DIETER, K.—Analytic computation of the response of three dimensional ore bodies to an induced polarization survey ³	114

¹ Under a cost sharing grant by the Defence Industrial Research Program of the Defence Research Board.

² Jointly supported by the National Research Council and Huntac Limited.

³ Jointly sponsored by Huntac Limited and a group of mining companies.

ENGINEERING
IV

DEPARTMENT OF HIGHWAYS

Road Design Division

FARREN, D. W. — Development of safe side slopes for highway.....	115
Warrents for urban highway crossings.....	116
Highway illumination methods and standards.....	117

Traffic and Planning Studies Division

FORSTER, J. L., HARMELINK, M. D., SEELEY, M., RAYCROFT, A. — Evaluation of freeway signs.....	118
TREW, J. S. — Flashing beacons on stop signs.....	119
TREW, J. S., LAZAROW, B. — School and pedestrian crosswalk study...	120

Research Branch

CHOJNACKI, B. — Performance of sealing compounds for joints in rigid pavements (0634).....	121
Evaluation of concrete curing and sealing compounds (0060).....	122
Investigation of alkali-reactivity of Ontario aggregates. (0635).....	123
CHONG, G., STOTT, G. M. — Evaluation of municipal roads and streets	124
DUGGAL, A. N. — Sampling procedures used in origin-destination studies	125
DUNIKOWSKA, Z. — Classification of chert for use in highway construction. (0629).....	126
FROMM, H. J. — Investigation of the cracking of flexible pavements. (0623).....	127
Evaluation of corrosion inhibitors for use in salt used for winter maintenance of highways. (0659).....	128
Chromatographic analysis of paving asphalts.....	129
HARMELINK, M. D. — Warrants for left-turn lanes. (0654).....	130
The estimation of annual average daily traffic and design hour volumes from the results of short surveys. (0647).....	131

ENGINEERING

LESLIE, A. — Study of maintenance management.....	132
SCHONFELD, R. — A full-scale bases and surfacings experiment on Highway 10, Brampton, Ontario. (0640).....	133
Factors affecting skid resistance of highway pavements. (0627)....	134
SCHONFELD, R., CHISHOLM, R., CIUPA, D. — Quality control of embankments and granular bases.....	135
TAMBERG, K. G. — Economic significance of vehicular load limitation.	
Part 1 — Bridges. (0662).....	136
Bridge design loads. (0653).....	137
WOLFE, R. I. — Recreational transportation in Ontario. (0639).....	138

Materials and Testing Division

CHOJNACKI, B. — Methods of getting an early estimate of the strength of concrete. (0617).....	139
CORKILL, J. — Factors affecting the performance of asphalt pavements. (0608).....	140
Bridge deck waterproofing systems.....	141
LO, K. Y. — Pore pressures set up in soils during pile draining operations	142
PHANG, B. — Use of fillers in bituminous paving mixtures.....	143
PHANG, W. — Effect of additives on coating and stripping of asphaltic concrete. (0651).....	144
PHANG, W., FIELD, F. — A study of thin bituminous overlays, design and performance.....	145
RYELL, J. — Effect of cement characteristics on performance of admixtures for Portland cement concrete. (0661).....	146
The occurrence of false-set in Portland cement concrete.....	147
SMITH, P. — Methods of repairing joints in concrete roads.....	148
Use of light-weight concrete in bridges.....	149
Joint design for concrete pavements.....	150
SMITH, P., SELMINS, G. — Sands from central and northern Ontario which accidentally entrain air in concrete.....	151

ENGINEERING

SMITH, P., WOOLGER, G. — Study of volume changes in concrete, especially as they affect concrete pavement performance.....	152
SMITH, P., KIP, A. — Factors affecting the selection of the type of con- struction used on highways.....	153
STERMAC, A. G., BARSVARY, A. — Long-term observation of pore pressures and settlements beneath a high embankment on varved clay.....	154
STERMAC, A. G., BARSVARY, A., SELBY, K. — Bearing capacity of friction piles in stiff clays.....	155
STERMAC, A. G., SELBY, K., DEVATA, M., BARSVARY, A. — Short-term and long-term stability of talus slopes.....	156
Pore pressures due to pile driving.....	157
SUTER, A. C., HARMELINK, M. D., RAYCROFT, G. — All-weather lane markings for highways.....	158
VINCENT, P. T. — Determination of corrosion of reinforcing steel in concrete.....	159

HYDRO-ELECTRIC POWER COMMISSION

Research Division

ADAMS, J. I. — The design and construction of a 540-psi triaxial cell with a fully automatic K control system, for testing 2-inch diameter soil samples.....	160
Development of laboratory test methods for determining the sus- ceptibility of compacted clay fills to cracking.....	161
Laboratory model and field study of the uplift capacity of founda- tions in sand and clay.....	162
ADAMS, J. I., HANNA, T. H. — Analysis of the stability of a sloping-core rock-fill dam during rapid drawdown conditions.....	163
A study and analysis of the driving performance and loading behaviour of instrumented pipe and H-section piles driven to a depth of about 140 feet in soft clay.....	164
The in-situ measurement of horizontal movement and vertical heave of a soft clay, caused by a deep excavation.....	165

ENGINEERING

ADAMS, J. I., HANNA, T. H.

Determination of the anisotropic properties of soils by correlation of the results of in-situ horizontal-plate bearing tests with those of laboratory tests on horizontal and vertical samples.....	166
CAMERON, A. W. W., JONES, A. S.—Study of service aging of distribution cables.....	167
CAMERON, A. W. W., KURTZ, M.—Studies of humidity deposition on electrical insulation surfaces.....	168
Endurance testing of new synthetic insulations for large generators	169
Construction and test of pilot installation of a novel low-cost oil-insulated 115-kv cable.....	170
Measurement of surface-breakdown properties of various electrical insulations under conditions of precipitation and contamination..	171
Measurement of short-time and long-time performances of novel electrical insulations.....	172
CAMERON, A. W. W., LINCK, H.—Establishment of probability data for lightning voltages in transmission lines and stations.....	173
Development and trial of improved lightning-flash counters and protective gap discharge counters.....	174
Investigation of performance of protective gaps under lightning and switching surges, with special reference to extra-high-voltage systems.....	175
Analyses of surge characteristics of transformers and generators..	176
CAMERON, A. W. W., LISHCHYNA, L.—Investigation of effect of lightning currents on distribution fuses.....	177
CAMERON, A. W. W., McHENRY, B. L.—Study of measurement and simulation methods for hot-spot temperatures of large power transformers and generators.....	178
Study and improvement of protective systems for power-station auxiliary motors.....	179
CAMERON, A. W. W., McHENRY, B. L., WATSON, W.—Development of accurate methods to measure speed variations of large hydro generators under transient conditions, and application of resulting signals to stabilizing control.....	180

ENGINEERING

CAMERON, A. W. W., WATSON, W. — Measurement and analysis of switching surges on 500-kv transmission lines.....	181
Studies of behaviour of large interconnected electric power systems, including effects of governors and computer studies of voltage-regulator effects.....	182
Analogue study of overvoltages at neutrals of ungrounded 230-kv transformers.....	183
Studies of effects of electric-arc furnaces on power systems.....	184
CASSAN, J. G., DAVIDSON, G. E. — Performance of fluorescent street-lighting luminaires under a wide range of ambient temperatures..	185
CASSAN, J. G., EDGAR, J. N. — Investigation of problems of electrostatic induction under ehv transmission lines.....	186
Appraisal of short-circuit performance of electric conductors and hardware.....	187
Investigation for grounding methods for electric power transmission and distribution systems.....	188
CASSAN, J. G., ENDRENYI, J. — Determination of current-carrying capacities of overhead line conductors from electrical load and weather history.....	189
CASSAN, J. G., NIGOL, O. — Corona performance of artificially contaminated high-voltage line hardware.....	190
Methods for locating oil and gas leaks in underground cable circuits	191
CASSAN, J. G., WEST, G. H. — Investigation of electric storage space heating for residences.....	192
Applications of artificial cooling to underground high-voltage cables	193
CASSAN, J. G., ZOB, A. P. — Development of design methods for commercial water-heating systems.....	194
CASSAN, J. G., ADAMS, J. I., BALJET, A. F. — Investigations of soil thermal resistivity and moisture migration phenomena.....	195
CASSAN, J. G., EDGAR, J. N., FITZGERALD, G. W. N. — Methods of evaluating performance of contaminated high-voltage insulators.	196
CLENDENNING, T. G., CHAPIN, C. — Quick-setting shotcrete — a comparison of physical properties of pneumatically placed concrete incorporating various accelerating admixtures.....	197

ENGINEERING

CLENDENNING, T. G., LOUGHBOROUGH, M. T. — False setting in Portland cement — its causes, effects and methods of control.....	198	
Study of the causes and means of alleviation of cracking in gypsum plaster.....	199	
Evaluation of moisture condition of concrete in service and the influence of moisture level on the properties of concrete.....	200	
CLENDENNING, T. G., STURRUP, V. R. — Study of various means of control of cracking in concrete through control of temperature gradients..		201
Evaluation of the influence of high-strength reinforcement on the behaviour of reinforced concrete.....	202	
Development and trial of accelerated control tests of the compressive strength of concrete.....	203	
Re-evaluation of existing criteria for designing concrete for durability in hydraulic structures.....	204	
CLENDENNING, T. G., STURRUP, V. R., CHAPIN, C. — Evaluation of the durability of concrete structures in service.....		205
CLENDENNING, T. G., MANTUANI, L. DOLAR, STURRUP, V. R. — Evaluation of the durability of concrete through outdoor exposure tests		206
FITZGERALD, G. W. N., LINCK, H. — Study of measurement techniques for very steep wavefronts (4000-kv per microsecond) and calculation of impulse-testing circuit parameters.....	207	
HARRISON, D., FERRIE, J. S. — Change of air and water content of transformer oils in service.....	208	
Correlation with service performance, of laboratory test for reserve rust inhibitor in steam turbine oils.....	209	
Optimum use of filter paper for reconditioning electrical insulating oil in plate and frame filter presses.....	210	
HOGG, A. D. — Investigation of mechanical service loads on transmission-line towers.....	211	
HOGG, A. D., EDWARDS, A. T. — Studies of nature of and means for controlling fluid pulsations in steam pipes and associated instrument lines.....	212	

ENGINEERING

HOGG, A. D., GUNG, G. — Study of settlement of heavy structures for purpose of correlation with structural defects and alignment difficulties in heavy machinery.....	213
HOGG, A. D., HARVARD, D. G. — Study of fatigue life of metallic sheathing materials for electrical conductors.....	214
Investigation of stresses in horizontal cylindrical tanks and pipes..	215
HOGG, A. D., WILLMOT, J. G. — Investigation of reinforcing-bar service loads in concrete scroll cases.....	216
Investigation of parameters of importance in the phenomenon of turbo-planning in hydraulic turbines.....	217
Investigation of scroll-case pressures during changes in flow.....	218
JACOBSEN, R. C. — Miscellaneous Studies pertaining to problems of corrosion and cathodic protection of under ground pipes and cables, tower footings and piles, and of water-heater tanks, that arise in day-to-day operations.....	219
Field trials of domestic electric hot-water heaters and their components.....	220
LESLIE, J. R., BOZOKI, B. — Frequency-shift carrier relaying equipment — study of alignment procedures and of response in presence of noise.....	221
LESLIE, J. R., BROWN, R. D., KEYSER, G. M. — Application of electronic techniques to power system protection.....	222
Study of digital telemetering and display systems.....	223
LESLIE, J. R., HICKS, R. L. — Measurement of low-frequency and other noise voltages on control cables in large plants.....	224
LESLIE, J. R., KORTSCHINSKI, J. — Transient-fault location on ehv lines.	225
LESLIE, J. R., STELER, M. K. G. — Remote temperature measurements on high-voltage apparatus by means of infrared radiation.....	226
LESLIE, J. R., REICHMAN, J., JONES, D. E. — Study of radio and television interference problems from EHV, HV and LV power lines.....	227

ENGINEERING

LESLIE, J. R., JONES, D. E., PERZ, M. C., BOZOKI, B. — Carrier frequency studies on high-voltage lines propagation, attenuation, spectrum usage, coupling, and operation during faults.....	228
SHELSON, W., TEMPLETON, J. G. C. — Optimum safety stocks in coal-ordering for thermal power stations.....	229
SIMPSON, F. J., BROWN, T. A. — Long-term study of the effect of field service on the fatigue life and other mechanical properties of power conductors.....	230
Investigation of effect on physical properties of both acsr and all aluminum conductor, of operation at relatively high temperatures	231
SIMPSON, F. J., HOLMES, B. A. — Study of the cavitation resistance of metals and alloys.....	232
SIMPSON, F. J., MARTIN, W. A. — Studies of the toxicity of fumes from the spraying and welding of stainless steels.....	233
Long-term study of atmospheric corrosion of metals and metallic coatings.....	234
Long-term study of aqueous corrosion of metals and metallic coatings.....	235
SIMPSON, F. J., MARTIN, R. B. — Studies of physical stability of vehicles and construction equipment.....	236
SIMPSON, F. J., PLATT, J. C. — Study of strength of full-size wood poles, and correlation with laboratory test data from small specimens..	237
Study of properties and applications of synthetic fibre ropes.....	238
SIMPSON, F. J., WALKER, R. F. — Investigation of the resistance of cast aluminum alloys to stress corrosion.....	239
SUGGITT, J. W. — Continuous study of preservatives for organic materials.....	240
Study of long-term effectiveness of preservatives in wood poles in service.....	241
Laboratory and field appraisal of non-metallic protective coatings for underwater steel.....	242
Laboratory and field appraisals of elastomeric joint sealants.....	243
SUGGITT, J. W., CORDINGLY, D. C. — Long-term study of properties and applications of elastomeric materials.....	244
Evaluations of properties and application of adhesive materials....	245
Possible applications for plastic piping in thermal generating stations	246

ENGINEERING

SUGGITT, J. W., GRAFT, C. M. — Evaluation of surface preparation for metals prior to painting.....	247
SUGGITT, J. W., KELLAM, B. — Methods of using plastic materials as jackets for cables.....	248
Determination of fire hazards inherent in use of plastic materials, and development of pertinent test methods.....	249
VANDERLECK, J. M., IWANUSIW, O. W. — Relaying accuracy of instrument current transformers under power-system fault conditions.	250
Development of a system for accurate wide-range demand metering of electric power.....	251

DEPARTMENT OF MINES

Mines Inspection Branch

BARRETT, C. M., LANG, J. G. ¹ — Non-destructive testing of wire rope.	252
--	-----

ONTARIO RESEARCH FOUNDATION

Department of Engineering and Metallurgy

CAVANAGH, R. L., FORMAN, J. — Jet smelting project — Reduction and smelting of fine iron ore in one step.....	253
CAVANAGH, R. L., LAST, A. J. — Ultrasonic applications — Research and development in the use of ultrasonic energy in processing in various industrial fields.....	254
CAVANAUGH, R. L., MICHAUD, G. — Uranium metals project — Study of uranium-iron phase diagram, high iron portion.....	255
CAVANAUGH, R. L., RISDON, A. — Investigation of pellet binders for iron ore concentrates.....	256
CAVANAUGH, R. L., KORZEKWA, T., ALLEN, C. — Ferrous metallurgy research — Development of new ideas, processes in fields of process metallurgy and ore dressing.....	257
CAVANAUGH, R. L., BRATINA, J., MCGRATH, J. — Metal physics research — Study of deformation of metals (e.g. fatigue) by non-destructive techniques.....	258

¹ McPhar Manufacturing Limited.

ENGINEERING

DEPARTMENT OF TRANSPORT

Metropolitan Toronto and Region Transportation Study

- WADE, P. E., Metro Toronto, D.H.O., D.M.A., T.T.C., C.P.R., C.N.R.,
Economics and Development — Investigation of present and
future transportation requirements as determined by forecasted
regional development — Study leading to policy recommenda-
tions for Administration and Finance..... 0259

ONTARIO WATER RESOURCES COMMISSION

Research Division

- HARRIS, A. J., CHRISTIE, A. E., FIELDING, M. B. — Sewage effluent
nutrient removal by algae..... 259
- HARRIS, A. J., BLACK, S. A., FIELDING, M. B. — Evaluation of effluent
polishing facilities for municipal sewage treatment plants..... 260
- HARRIS, A. J., BLACK, S. A., LEWANDOWSKI, W. — Supplementary aera-
tion of waste stabilization ponds for sewage treatment..... 261
- HARRIS, A. J., BOYKO, B. I., GUILLAUME, F. — Investigation of the
anaerobic digestion process at five Ontario Water Resources Com-
mission operated waste-water treatment plants..... 262
- HARRIS, A. J., GUILLAUME, F. — Evaluation of the air aqua oxidation
system as a means of wastewater treatment..... 263

ATLAS STEELS COMPANY

- CARSON, R. O., KRISTIANSEN, J. — The development of alloy steels used
for mining hollow drill rods..... 264
- KNIGHT, D., HAYNE, M., KRISTIANSEN, J. — Development of the con-
tinuous casting process..... 265
- PALMER, A. — Investigations of the origin of surface defects during
rolling of stainless steel strip..... 266
- SETH, B. — Evaluation of the thermal fatigue resistance of materials and
development of superior die materials for die casting of bars... 267
- SETH, B., GRAHAM, R., HAYNE, M. — Development of high speed quality
tool steels..... 268

ENGINEERIN^G

- WHITTAKER, D. A., CROSSLAND, K. — Development of an improved remelting process for quality alloy steels..... 269

CANADIAN GENERAL ELECTRIC

- BRADSTREET, B. J. — Exploration of defects associated with high speed automatic welding of mild steel..... 270

- BRADSTREET, B. J., BHAN, A. K. — The ultrasonic examination of structural steel welds..... 271

- ELLIS, J. R., BRIGGS, H. A., BEEVERS, C. L. — Measurement of losses in silicon steel at high densities and with controllable complex waveform..... 272

- MILLER, G. F., DE BUDA, R., JAGGER, C. E. — Research in signal processing..... 273

- MULHALL, V. R., ATKINSON, E. A. — Evaluation of corona endurance capabilities of insulating systems..... 274

- SCRIMGEOUR, J., NUNWEILER, D., OLMSTEAD, R., DRYNAN, D. — Analytical investigation of processes in the pulp and paper industry to develop mathematical models and control strategies of the continuous digester, bleach plant and paper machine for computer control..... 275

- SCRIMGEOUR, J., HAMILTON, R. E., FULLERTON, I. — Analytical investigation of processes in the mining industry to develop mathematical models and control strategies for computer control of selected processes..... 276

THE CONSOLIDATED MINING AND

SMELTING COMPANY OF CANADA LIMITED

- BELL, R. C. — Basic study of the action of xanthates and other reagents in flotation..... 277

- Application of mathematical and computer techniques to technological problems (e.g. process simulations, design considerations, etc.)..... 278

ENGINEERING

Computer programming of production and distribution of products (e.g. mines, metallurgical and chemical plants, shipping, warehousing, etc.).....	279
Derivation of a mathematical model for flotation operations.....	280
Electrochemical studies of zinc electrowinning.....	281
WELLINGTON, J. R. — Lead and zinc alloys.....	282
Continuous casting of lead and zinc.....	283
Zinc extrusion.....	284
Use of lead for noise control.....	285
Zinc alloy die casting.....	286
Hot-dip galvanizing.....	287
Corrosion, lead and zinc.....	288

DEHAVILLAND AIRCRAFT OF CANADA LIMITED

MAINE, A. E. — Construction and study of properties of near infrared interference spectrometer ¹	289
Radiation bolometer for visual and infrared regions.....	290
Zero bending tubular STEM space elements.....	291

DILWORTH, SECORD, MEAGHER AND ASSOCIATES LTD.

BILLINGTON, I. J., FITZSIMMONS, T. E., TORONCHUK, J., RAYFIELD, J. A., TILLSON, L. J. P. — Research related to the operation of controlled leakage seals for rotating shafts ²	292
BILLINGTON, I. J., BELL, R. P. — Gas turbine engine silencing ³	293
BREMNER, G. F., GOULDING, H. — Explosive decompression of water. ⁴ (This work concerns the transient fluid flow resulting from the sudden rupture of a pipe initially containing high pressure, high enthalpy, water or steam-water mixtures).....	294

FITZSIMMONS, T. E., RAISSIS, E. K., SAMPAT, S. H., SCHDER, M. — Studies related to the flow of high temperature liquid Pb-Bi eutectic ⁵	295
---	-----

¹ Jointly with Federal Government under DIR Program.

² On behalf of Champlain Power Products Ltd.

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⁴ On behalf of Atomic Energy of Canada Limited.

⁵ On behalf of Atomic Energy of Canada Limited.

ENGINEERING

FERRANTI-PACKARD ELECTRIC LTD.

ATHERTON, D. L. — Applied Cryogenics: magnets, fluxpumps and DC generators of potential use in loss free power transmission, Thermal insulation.....	296
BELAK, M. J. — Communication system having time spreading features to alleviate impulse interference. Network synthesis, computer controlled error logging system.....	297
BOHDANOWICZ, A., WHERRY, F. E. — Development of a method of calculating internal corona inception or gassing voltage at any point in an oil filled transformer.....	298
DAVIS, H. J., KINNIBRUGH, D. R. — Development of high temperature fuel cells for hydrocarbon fuel.....	299
KEIL, C., KOCHER, H., WAGERER, G. — Development of a hypothesis for the prediction of corona inception in insulation structures of oil and oil impregnated paper during power frequency, impulse and switching surge tests.....	300
OSBORNE, H., MUNROE, E. J. — Development of devices for the attenuation of transformer noise.....	301
SIMO, E., REDMON, N. — The effect of drying and degassing of transformer insulations (including oil) on the point of corona inception during dielectric tests.....	302
TAYLOR, M. K., WINDROW, D. — Systems for display of information using magnetisable elements for use in ambient light.....	303
TYLER, A. R. — Superconducting computer element and storage, precision evaporated film techniques.....	304

GARRETT MANUFACTURING LIMITED

ATKINSON, B. W., GILL, P. S., PRINCE, C., PEARS, B., KILICK, K. — Flight Instrument Test Sets — To develop self-contained flight instrument test sets which provide highly accurate and stable static and total pressures to simulate aircraft flight conditions on the ground.....	305
---	-----

ENGINEERING

HICKLING, C. D., FLACKS, C., STAUSKAS, P., WANG, S. — Static Power Supplies — To develop static inverters which operate from DC power sources and deliver regulated AC power, ranging from a few VA up to approximately 2. 5KVA.....	306
RICHARDSON, R. J., FAICZAK, J., HEYBROEK, C., ZUTRAUEN, S. — Temperature Control Systems — These systems which include solid state electronic controllers, temperature selectors, duct sensors and anticipators are employed for various aircraft compartment temperature control as well as anti-ice control. Included in this work are systems for the control of engine bleed air and/or ram air.....	307

LITTON INDUSTRIES

KYDD, JOHN — Investigation of digital computation for aircraft navigation systems.....	308
LEWIS, D., STEIN, A. — Research and Development in myo-electric devices.....	309

MARSLAND ENGINEERING LIMITED

ARMSTRONG, A. S., DIETZ, R., PRICE, B. — Visual range computers	310
JONES, J. N., MORITZ, F., PRICE, B., FAIREY, B. — Special field telephone sets (self powered).....	311
LEESON, F. D., ROWE, R., GRUNWELL, M. — Sonar simulators for training aids (military requirements).....	312
MARSLAND, L. H., ARMSTRONG, A. S., PRICE, B. — Small analogue plotting systems.....	313
WALKER, R. W., CONNER, J. — Solid state stereo and public address amplifiers. (15 watts to 100 watts).....	314

UNION CARBIDE CANADA LIMITED

BATA, G. L., VADORI, M. R. — Lubrication and heat transfer studies using synthetic polyethers.....	315
--	-----

ENGINEERING

BATA, G. L., ZALKOWITZ, R. S., PATTERSON, I. — Plastics insulations in power transmission systems.....	316
BATA, G. L., ZALKOWITZ, R. S., SINGH, K. P. — Study of stabilizer systems in polymer degradation processes.....	317

SINCLAIR RADIO LABORATORIES LTD.

BUCKLES, F. G., LAINEVOOL, J., BILO, D., DANDY, J. H. — UHF Filters — Automatic testing.....	0318
BUCKLES, F. G., INKSTER, D. — Intermodulation investigation.....	0319
OKSIUTIK, G., STANAT, W. — Antenna cross-over network.....	0320
SECORD, A. H., GRAHAM, G. — H.F. control circuitry.....	0321
SECORD, A. H., BELCHER, R. — Measurement of phase jitter.....	0322
TILSTON, W. V., SECORD, A. H. — Colinear antenna investigation.....	0323

FORESTRY

V

DEPARTMENT OF LANDS AND FORESTS
Forestry Research Branch

BECKWITH, A. F. — Problems in measurement, recording and processing of data concerning the growth and yield of forest stands and individual trees. Estimating the availability of timber resources and products. Design and analysis of investigations to evaluate the productivity of artificial and natural stands.....	318
CARMICHAEL, A. J. — Study of the relation of anatomical and chemical wood properties to product quality.....	319
FOWLER, D. P., HEIMBURGER, C., RAUTER, M. — Tree-breeding work is attempting to develop white pine which is resistant to blister rust-hybrid aspen-type poplars of good growth form and disease resistance and quality spruce for lowland sites in Northern Ontario.....	320
GORDON, A. G. — Growth and nutrition of spruce on a complete range of forest sites.....	321
Dry weight productivity and nutrient cycling in spruce forests....	322
Ecology of spruce and spruce forests.....	323
Studies of species and the racial variation of the spruce genus in relation to growth and relative efficiency in nutrient uptake....	324
HADDOW, W. R. — Study of the progress and effects of white pine blister rust in Ontario.....	325
HILLS, G. A., BOISSONNEAU, A. N., BURGER, D., PIERPOINT, G., WILLIAMS, J. R. — An assessment of the potential of the forest land of Ontario for the production of timber and other crops pursued simultaneously at the regional level of study and at the factorial level with site regions.....	326
HOLOWACZ, J. — Advising on the economic aspects in the planning of forest research projects.....	327
Participating in forest research projects requiring economic analysis	328
Investigating occasional market opportunities for forest products..	329

FORESTRY

HOLOWACZ, J.

Studying the relationship between forest resources of Canada and those of Eastern Europe with special reference to the U.S.S.R., the principal prospective competitor in world forest products markets.....	330
LARSSON, H. C., JACIW, P. — Establishment of selected high quality silver maple and eastern cottonwood in swamps devastated by the Dutch elm disease.....	331
Establishment of high quality hard maple, poplar, red oak and black cherry in low quality mis-managed stands on the uplands..	332
Selection of high yielding trees of five maple species for the production of maple sap and syrup.....	333
Use of silvicides, herbicides and soil sterilants for stand conversion, weed and shrub control, thinning and de-barking.....	334
Detailed growth studies on hard maple, silver maple, black cherry, American basswood, white ash and eastern cottonwood.....	335
LEECH, R. H. — Studies of the nutritional needs of conifers, particularly red pine, made through application of mineral fertilizers. The purpose is to develop techniques for determining season of uptake of nutrients and to measure the growth effects of nutrients by plot designs, mensurational devices and foliar and soil analyses. Also, to determine economic return from fertilizers.....	336
LYON, N. F., MCEWEN, J. K., KOKOCINSKI, G. — A study of the silvicultural characteristics of tree species of Northern Ontario. A study of the effects of excessive moisture conditions on tree growth in the Cochrane Clay Belt.....	337
MCLEAN, M. M., ANDERSON, H. — A study of the growth and quality of sugar maple in Central Ontario and a study of regeneration problems.....	338
MULLIN, R. E., GLERUM, C. — Research in all aspects of artificial regeneration for the technical and scientific improvement of the reforestation program.....	339
RAYMOND, F. L. — Studies in forest mathematics. The studies are mainly concerned with the adaptation of existing statistical and mathematical theory to the practical needs of forestry investigations and operations.....	340
SINCLAIR, G. A., STROEMPL, G. — Study of silvics of Southern Ontario tree species and the effects of prescribed burning and its role in forest management.....	341

LIFE SCIENCES

VI

DEPARTMENT OF THE ATTORNEY GENERAL

Attorney General's Laboratory

BROOKS, G., FAN, J. — The effect of decomposition products on stability of drug products.....	342
GUPTA, R., GRAHAM, E. (Miss) — The effect of sedative drugs on driving ability.....	343

DEPARTMENT OF LANDS AND FORESTS

Wildlife Research

FYVIE, A., JOHNSTON, D. — Disease and parasites of wildlife — their effects on wildlife populations and their influences on livestock and humans.....	344
HEPBURN, R. L., SIMKIN, D. — Big game — populations, distributions, ecology and reproduction of deer, moose, and caribou. Effects of weather, hunting, predation, range quality.....	345
KOLENOSKY, G., ADORJAN, A., SHANNON, J. — Predators — populations distributions, ecology, reproduction of wolf, coyote, black bear and polar bears — effects of wolf and coyote on wildlife and wildstock — development and application of predation control methods.....	346
LUMSDEN, H. G., EVANS, E. V. — Upland game and waterfowl — populations, distribution of ruffed grouse and prairie grouse. Studies of reproduction of Canada geese.....	347

STEPHENSON, A. B. — Fur-bearers — populations distributions, ecology and reproduction of beaver and otter. Effects of trapping, predation, range quality; analysis of harvest statistics for most fur bearers.....	348
--	-----

Fisheries Research

BERST, A. — Determine the effects of disease on survival of planted trout	349
---	-----

LIFE SCIENCES

BERST, A., DEWAR, J. E., TAIT, J. S. — To develop through artificial selection, a stable, reproductive hybrid between lake trout and brook trout, which will be capable of living in the Great Lakes habitat formerly occupied by lake trout.....	350
To describe the life history and ecology of splake (hybrid between brook trout and lake trout) introduced to natural waters.....	351
To explore the potential of selective breeding of fish as a technique in modern fish management in changing environments.....	352
CHRISTIE, W. J. — To determine and describe the factors causing the violent fluctuations in abundance of white fish in the Bay of Quinte and Lake Ontario.....	353
To assess the possibility of re-establishing a commercially useful population of lake trout in eastern Lake Ontario while the sea lamprey population continues to exist in the area.....	354
To trace the arrival and build-up in Lake Ontario of the white perch, a new species in this lake and to assess its impact on other resident species.....	355
CHRISTIE, W. J., COBLE, D. — To determine the life history and movements of the American eel in Lake Ontario and tributary waters, to assess the potential of the population for increased exploitation by commercial fishermen and to assess the effect if any, of installation of the St. Lawrence Seaway on the size of the population	356
To assess the extent of exploitation by anglers and by commercial fishermen on the walleye population of the Bay of Quinte during times of both scarcity and abundance, and to determine whether the two kinds of fishermen actually compete for fish.....	357
To explore, using trawls, the open part of Lake Ontario for stocks of fish of potential commercial value.....	358
CHRISTIE, W. J., LOFTUS, K. H. — To attempt the introduction of Kokanee, a land-locked variety of sockeye salmon, to Lake Ontario in an effort to complement existing fish stocks with this new species. It is hoped that populations can be established for both sport and commercial use.....	359
COBLE, D. — To study the growth of a number of species e.g. suckers, yellow perch, etc., using special injections which are deposited in the bones and scales of the fish to form time marks.....	360

LIFE SCIENCES

COBLE, D., FRY, F., MAHER, F.— To document the contribution of successive year classes of smallmouth bass to the sport fishery of South Bay. These data test the reliability of predictions of the quality of bass angling based on a temperature index known to influence year class strength of bass in their first year of life.....	361
To document through experimental fishing and sampling, the long term changes in the fish populations vulnerable to pound nets in South Bay, Lake Huron.....	362
CUCIN, D., COLLINS, J., FRY, F., MAHER, F., REGIER, H., SMITH, J.— To discuss and describe the factors influencing the strength of whitefish year classes throughout Lake Huron.....	363
DECHTIARENKO, A.— To document the build-up, in the smelt of Lake Erie, of the sporozoan parasite, <i>Glugea Hertwigi</i>	364
To survey the parasites occurring in the important fishes of Ontario and to discover those which may be important influences on abundance of fish.....	365
FABER, D.— To discover and study the factors influencing year class strength (survival of whitefish during their first year of life) of whitefish in South Bay.....	366
FERGUSON, R. G.— To study spawning smelt throughout Lake Erie to determine whether there are discrete spawning populations which may require separate management.....	367
To describe the horizontal and vertical distribution of smelt in Lake Erie and to determine the environmental factors which influence that distribution.....	368
To study the factors related to the alternate strong and weak year classes of smelt in Lake Erie.....	369
To monitor, by sampling, the catches made by Lake Erie commercial fishermen in order to assess the status of the various fish populations and the impact of the fishery on these populations..	370
To develop, if possible, index fishing stations at which samples of young-of-the-year fish representative of the entire Lake Erie population situation can be taken.....	371
FRASER, J. M.— To measure and describe the scope of normal, year to year changes in natural brook trout populations.....	372

LIFE SCIENCES

FRASER, J. M.—

To increase the numbers of brook trout available to anglers by manipulating harvest.....	373
To investigate the possibilities of providing spawning facilities (artificial if necessary) for brook trout to improve success of natural reproduction.....	374
To determine the potential use of fish toxicants in the management of lakes for brook trout.....	375
To investigate the role of white suckers in limiting the survival of planted brook trout in lakes.....	376
To investigate the variety of lake environments inhabited by brook trout with a view to developing a useful classification of such lakes	377
To develop a practical stocking rate formula for types of brook trout lakes in order to more efficiently use hatchery stocks.....	378
FRASER, J. M., MACLEOD, J. C., MARTIN, N. V.—Algonquin Park Creel Census — The measurement of the harvest of important game species by anglers in a number of waters annually.....	379
MACLEOD, J. C.—To evaluate the success of planting small-mouth bass fingerlings in lakes already supporting a bass population.....	380
To measure the sub-lethal effects of detergents on smallmouth bass, e.g. do they effect reproduction, feeding, respiration, activity?..	381
To study the factors involved in the production of eggs, fry and fingerling smallmouth bass, with a view to determining how summer temperatures influence year class size in Lake Opeongo.	382
To determine the factors influencing the growth of smallmouth bass during their first year of life and to determine their effect on the ability of bass to survive their first winter.....	383
MAHER, F. P., LOFTUS, K. H.—An experiment is under way to attempt the establishment in Lake Huron of Kokanee, a land-locked variety of sockeye salmon, as a new species for commercial and sport fisheries.....	384
MAHER, F. P., FRY, F., SMITH, J.—To describe the survival growth and life history of splake (hybrid between lake trout and brook trout) planted in various parts of Lake Huron.....	385

LIFE SCIENCES

MARTIN, N. V. — To compare plankton feeding with fish feeding lake trout in terms of growth rate, age at maturity, population stability, egg production, quality of fishing produced, and management techniques necessary.....	386
To discover the reasons for the poor survival of hatchery reared yearly lake trout when planted in lakes, e.g. Opeongo, of the Laurentian Shield. The role of soft water vs. hard water is now being investigated.....	387
MARTIN, N. V., JERMOLAJEV, E. — To study the very early life history and ecology of lake trout to discover whether this stage is important in determining the numbers of lake trout in a population from year to year.....	388
McCOMBIE, A. M. — To study the plant plankton of the Bay of Quinte, Lake Ontario and to make qualitative and quantitative comparisons with 1945 data with a view to determining the effects of and rate of eutrophication (ageing, enrichment).....	389
To study specific physical (temperatures, seiches, currents) and chemical (oxygen, hardness, pH, etc.) conditions of waters in relation to areas and times specified as important to particular fisheries problems.....	390
McCOMBIE, A. M., LOFTUS, K. H. — To provide liaison in fisheries interests with the Great Lakes Institute, University of Toronto in respect to the support provided for that agency in its limnological research on the Great Lakes.....	391
RECKAHLN, J. — To measure the survival and growth of Kokanee in Lake Huron and to describe their feeding habits.....	392
RYDER, R. A. — To prepare an annotated bibliography on walleyes and on closely related North American species.....	393
To describe the ecology of walleyes in a lake typical for walleyes in Ontario to provide an improved basis for management of the species.....	394
To study the horizontal and vertical variations of total dissolved solids and total alkalinity during the open water period in an oligotrophic (young) lake.....	395
To discover and describe a practical index or indices that will be useful in predicting the fish production potential of lakes.....	396

LIFE SCIENCES

- RYDER, R. A., DEWAR, J. E., MARTIN, N. V. — To study the suitability
of the Arctic Grayling as a sports fish in Ontario 397

ONTARIO RESEARCH FOUNDATION

Department of Applied Microbiology

- CAMPBELL, L. A. — Investigation into the possibility of applying the
microbiological techniques of Continuous Culture to the purification
of municipal sewage 398
- CAMPBELL, L. A., Smith, D. K. — The toxic action(s) of ozone on sewage
and water micro-organisms 399

Department of Organic Chemistry

- LADELL, J. L. — Study of morphology of plants, particularly trees 400

Department of Parasitology

- BENNETT, G. F. — Transmission, specificity and development of avian
trypanosomes 401
- FALLIS, A. M., BENNETT, G. F. — Attraction of black flies to odours and
other stimuli 402
- Malaria-like parasites of birds, their transmission, development and
effects on game and domestic birds 403
- FREEMAN, R. S. — Life histories of tapeworms of trout 404
- WRIGHT, K. — Development of eggs of certain parasitic nematodes ... 405
Structure of muscle system of parasitic nematodes in relation to
their movements 406

ONTARIO WATER RESOURCES COMMISSION

Research Division

- HARRIS, A. J., NEIL, J. H. — Ecology of cladophora with application to
control 407

LIFE SCIENCES

HARRIS, A. J., CHRISTIE, A. E.—Pesticide degradation by algae.....	408
Isolation and identification of excreted metabolites of algae as related to tastes and odours in water.....	409
The effects of receiving waters on the plankton of sewage lagoon effluents.....	410
Relationships between plankton production in artificially im- pounded surface waters and influent characteristics.....	411
HARRIS, A. J., CHRISTIE, A. E., JOHNSON, M. G.—Primary productivity of algae in Ontario Lakes.....	412
HARRIS, A. J., JOHNSON, M. G., CHRISTIE, A. E.—Benthic communities in relation to water quality.....	413
HARRIS, A. J., VAJDIC, ANN H., CHRISTIE, A. E.—Effects of sodium fluoride on growth and survival of several species of bacteria....	414
Isolation and identification of excreted metabolites of actinomycetes as related to tastes and odours in water.....	415
Isolation of animal viruses from water.....	416

PHYSICS

VII

HYDRO ELECTRIC POWER COMMISSION

Research Division

CASSAN, J. G., HOGG, A. D., EDGAR, J. N., ATTRI, N. S.—Dynamic response of bus-bar systems under short-circuit forces.....	417
HOGG, A. D., EDWARDS, A. T.—Investigation of nature and control of vibration of overhead power transmission conductors.....	418
Study of inter-conductor movements in bundle-conductor systems.	419
SUGGITT, J. W., CORDINGLEY, D. C.—Study of high-temperature insulating materials for thermal generating stations.....	420

ONTARIO RESEARCH FOUNDATION

Department of Engineering and Metallurgy

CAVANAGH, R. L., MARTIUS, U., NISKANEN, E.—X-Ray services — Development and application of specialized analytical X-Ray techniques.....	421
CAVANAGH, R. L., MARTIUS, U.—Structures and magnetic properties	422

Department of Physics

SCHUMACHER, B. W.—High altitude gas density gage based on single scatter of electrons.....	423
SCHUMACHER, B. W., GRODZISZEWSKI, J. J.—Photo-electron counter..	424
SCHUMACHER, B. W., RUMSEY, K.—Electron microprobe and atmospheric electron gun.....	425
SCHUMACHER, B. W., GRODZISZEWSKI, J. J., PRANCKEVICIUS, A.— Scanning microscope.....	426

PHYSICS

DEHAVILLAND AIRCRAFT OF CANADA LTD.

MAINE, A. E. — Study of behaviour of Q-spoiled Nd 3+ doped glass lasers.....	427
Study of radiative recombination lifetime in GaAs ¹	428
Surface properties of materials with respect to space applications..	429
Modulation of 3-dimensional microwave lenses.....	430
Advanced multi-phase solid state frequency conversion.....	431

DILWORTH, SECORD, MEAGHER AND ASSOCIATES LTD.

BILLINGTON, I. J., BREMNER, G. F., BELL, R. P., SEKE, MISS J., TILLSON, L. J. P. — Measurement techniques in two phase fluid flow ²	432
---	-----

DUPULATE CANADA LIMITED

BATESON, S., SINHA, N. K., GOLDING, W., HUNT, J. W. — Study of thermal tempering of flat glass.....	433
--	-----

EDO, CANADA LIMITED

ADHAV, R. S. — Piezoelectric crystals and their applications to ultra- sonics.....	434
---	-----

WELWYN CANADA LIMITED

MARTON, J. P., TAI, C., HESSE, H. — Research on non linear resistive films.....	435
MARTON, J. P., CECIL, R., LI, R. — Investigation of the electrical and optical properties of thin metal films.....	436

¹ Jointly with Federal Government under DIR Program.

² On behalf of Atomic Energy of Canada Limited.

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1967 RESEARCH INDEX

**Projects being carried on
within Ontario Government
Departments and Agencies,
and in a number of
Companies operating in
Ontario in**

**AGRICULTURE
CHEMISTRY
EARTH SCIENCES
ENGINEERING
FORESTRY
LIFE SCIENCES
PHYSICS**



WITHDRAWN
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FOREWORD

This third edition of the Ontario Research Index has confirmed the hopes of the Ontario Economic Council in that it can now claim to catalogue significant research undertaken in this province by government departments and agencies and by industries primarily based in Ontario.

University research is recorded by other agencies.

The purposes of this index are:

“to assist those responsible for decisions regarding research policy and funding to discover which areas are being actively investigated and where there may be gaps,”
and;

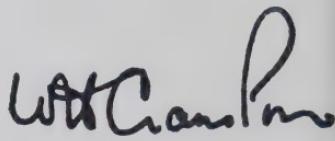
“to facilitate communication between those engaged in research and those who can put their findings into practical economic form.”

As before, coverage is restricted to those areas likely to produce the greatest industrial benefits – natural science and engineering. The fields of economics and sociological development are, of course, major factors in providing the ability to utilize the advances here described, but they must be assessed from other sources.

The Ontario Economic Council is gratified that the industrial sector has significantly increased its contribution to this edition. The unexpectedly large number of requests for the Index from Canadian and foreign sources has provided us with an opportunity to extend over a much wider area the potential for research cooperation. We thank those departments and agencies of the Ontario Government and particularly those Ontario companies which have made this summary possible. We also thank Dr. A. D. Misener, editor of these Indices, for believing that this is a useful activity and agreeing to assist us with its production.

We claim no perfection, only a good job started. Most thinking people agree that we are where we are because of ideas; we have many in Ontario.

This is an attempt to catalogue some of them for the benefit of all. Your suggestions as to future additions and revisions will, as in the past, be most welcome.

A handwritten signature in black ink, appearing to read "W.H. Crossman".

*Chairman,
Ontario Economic Council.*

NOVEMBER, 1967.

CONTENTS

	PAGE
Foreword	3
Index of Departments, Agencies and Companies	7
Index of Investigators	12
Subject Index	26
Directory of Projects	43
AGRICULTURE	
Projects 1–88	43
CHEMISTRY	
Projects 89–0178	53
EARTH SCIENCES	
Projects 169–183	63
ENGINEERING	
Projects 184–347	67
FORESTRY	
Projects 348–361	81
LIFE SCIENCES	
Projects 362–0435	85
PHYSICS	
Projects 432–454	95

INDEX OF DEPARTMENTS, AGENCIES AND COMPANIES

Department of Agriculture

- Horticulture Research Institute 1-16
Kemptville Agricultural School 17-38
Ontario Demonstration Farm 39-59
Western Ontario Agricultural School and Experimental Farm 60-76

Department of Attorney General

- Office of the Fire Marshal 184

Department of Energy and Resources Management

- Energy Branch 169

Department of Highways

- Materials and Testing Division 185-198
Research Branch 199-215
Road Design Division 216, 217
Traffic and Planning Studies Division 218

Department of Lands and Forests

- Fisheries Research Branch 362-410
Forestry Branch 348-361
Wildlife Research Branch 411-415

Department of Mines

- Mines Inspection Branch 219, 220

Hydro-Electric Power Commission of Ontario

- Research Division 221-264

Ontario Research Foundation

- Department of Applied Microbiology 416-420
Department of Engineering and Metallurgy 265-271
Department of Materials Chemistry 89-97

- Department of Organic Chemistry 98-109
Department of Physical Chemistry 110-113
Department of Physics 432
Department of Physiography 77, 170, 171
Department of Textile Research 114, 115

Ontario Water Resources Commission

- Laboratories Division 116-118, 421-426
Water Resources Division 172-178

INDUSTRIAL RESEARCH

- Abitibi Paper Company Limited 119, 120, 272, 273, 433, 434
Aluminum Laboratories Limited 274-277, 435
Atlas Steels Company Limited 278-283
British American Oil Company Limited 121-126
Burgess Battery Company 127, 128
Canada Packers Limited 0169-0178, 0432-0435
Canadian General Electric Company Limited 284-291
Canadian Westinghouse Company Limited 292-295, 436-440
Chemical Projects Limited 129, 296-299
Cominco
 Trail, B.C. 78, 133-138, 179, 308-313
 Sheridan Park 130-132, 300-307, 441
Dilworth, Secord, Meagher and Associates 314-319
Duplate Canada Limited 442-444
Edo (Canada) Limited 445
Eldorado Mining and Refining Limited 139-142
Electric Reduction Company of Canada Limited 143-146
Ferranti Packard Electric Limited 320-324, 446
Garrett Manufacturing Limited 325-327
Huntec Limited 180-183
Johnson, Mathey and Mallory Limited 328, 329
Lever Brothers Limited 147
Litton Systems (Canada) Limited 330, 447, 448
Mallory Battery Company of Canada Limited 148
Maple Leaf Mills Limited
 Hog and Lytle Seeds 79
 Agricultural Division 80-88
 Research Division 149-155

- Marsland Engineering Limited 331-336
Northern Electric Company Limited 449-454
Northern Radio Manufacturing Company Limited 337-339
Proctor and Gamble Company 156, 157
Sprague Electric of Canada Limited 158
Union Carbide Canada Limited 159-165, 340-342
Varian Associates of Canada Limited 343-347
Warner-Lambert Research Institute 427-431
Welwyn Canada Limited 166-168

ADDRESSES OF PARTICIPATING COMPANIES

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INDEX OF INVESTIGATORS

The purpose of this Index is to provide names of people who may be contacted for the purpose of obtaining further information regarding the projects here listed. Different agencies have different practices in this regard, some prefer you to contact the person most familiar with the work, others prefer that the director of the project or the director of the research division be the initial contact.

In the Directory of Projects, the first name in each project listed is the one the responders have indicated should be your initial contact.

This index lists all the individuals associated with the research. It is our method of giving due credit to those scientists and engineers who are properly proud of their achievements described in this volume.

Abrahamsohn, G.	325
Adams, A. M.	5, 6
Adams, J. I.	221-224
Adams, R.	127
Adamson, F.	294
Adhav, R. S.	445
Adorjan, A.	413
Andersen, E. T.	1-4
Anderson, H.	358
Andrejchyshyn, W. M.	165
Armstrong, A. S.	331, 335
Atherton, D. L.	446
Atkinson, B. W.	325
Atkinson, E. A.	288
Baldwin, C. S.	60, 61, 70, 72
Baldwin, S. H.	120
Baljet, A. F.	232, 233
Barber, H. D.	440
Barker, N. S.	327
Barouch, M.	173
Barr, G. R.	17
Barr, K.	18
Barrett, C. M.	219
Barsvary, A.	196
Bartnikas, R.	452
Basinski, J.	452

Basmadjian, D.	296
Bata, G. L.	159–165, 340–342
Batelaan, J.	329
Bateson, S.	442–444
Bays, N.	122
Beach, M. E.	19, 20
Beaton, J. D.	78, 133
Beattie, D.	62, 76
Beaudoin, J. J.	252
Beckwith, A. F.	348
Beecker, K.	344, 345
Beevers, C. L.	287
Belak, M. J.	320
Bell, R. P.	314, 317
Beninger, D. J.	166
Berg, W.	117
Berst, A.	362–365
Billington, I. J.	315–317
Bishop, J.	116
Bisset, H. A.	325
Bohdanowicz, A. B.	321
Boisonneau, A. N.	353
Bourgault, P. L.	328, 329
Bowness, E. R.	87
Boyes, M. H.	450
Bozoki, B.	237, 240
Bradstreet, B. J.	284, 285
Bradt, O. A.	1, 2, 9
Brajsa, Miss B.	100, 105
Bratina, W. J.	271
Bremner, G. F.	318
Briggs, H. A.	287
Brigham, R. J.	169
Brooke, K.	139
Brown, E. C.	89
Brown, J. A.	300
Brown, R. D.	241
Brown, R. H.	63, 68, 69
Brown, T. A.	225–227

Bruvelaitis, S.	329
Bryan, D. M.	184
Bryan, K.	447
Burger, D.	353
Burger, D. W. R.	328
Burger, F. J.	158
Burgess, T. D.	39
Burke, T.	0169, 0176, 0177
Burnett, K. A.	34, 36, 37
Butler, J. D.	39—45
Butler, R. E.	291
Cameron, A. W. W.	228—231
Campbell, G.	127, 128
Campbell, H. J.	115
Campbell, L. A.	416
Carmichael, A. J.	349
Cashmore, K.	121, 122
Cassan, J. G.	232, 233
Cavanagh, R. L.	220, 265—271
Chapman, L. J.	77, 170, 171
Chin, F. K.	168
Chojnacki, B.	185—187
Chong, G.	141, 188
Choo-Ying, A.	175
Christie, W. J.	366—372
Clark, F. A.	292
Clark, J. A.	421
Clark, J. H.	21—23
Class, R. E.	24—26
Clayton, N. S.	439
Clendenning, T. G.	252
Cline, R. A.	1—3
Coble, D.	369—371, 373—375
Collin, G. H.	1, 3, 4, 11
Collins, J.	376
Colton, D. R.	449
Conn, K.	141
Conner, J.	332, 336
Cook, Frances	7

Corkill, J. T.	189, 190
Corneil, R. B.	274
Craigen, W. J. S.	141
Crossland, K.	178
Croutch, V. K.	104
Crowther, R. F.	8
Csagoly, P.	214
Cucin, D.	376
Curtis, J. D.	27, 28, 33
Dalal, K.	293
Dalrymple, D.	319
Dalrymple, J. A.	29, 30
Das, B. S.	98
Davidson, G. E.	264
Davis, H. J.	322
Dean, M.	325
Dechtiarenko, A.	377, 378
de la Iglesia, F. A.	428–431
de Paz, J. F.	169
Desbrisay, A. W. Y.	337
de Valence, P.	204
Dewar, J. E.	363–365, 406
Dietz, R.	331
Diosady, P.	116, 117
Di Valentin, Mrs. C.	97
Dixon, P. R.	293
Donovan, R. G.	0435
Duckworth, P.	178
Dunikowska, Z.	191
Dutkewych, E.	0175
Dyck, P. J.	151, 152
Dyson, G.	326
Eastwood, H. K.	450
Effer, W. R.	417
El Assal, K.	95
Elgar, E. C.	286
Ellis, J. R.	287
Engler, F.	330
Eslinger, M. J.	0173

Faber, D.	379
Fairey, B.	332, 333
Farren, D. W.	216, 217
Ferguson, A. E.	83
Ferguson, R. G.	380–384
Fergusson, R. R.	451, 452
Fickert, K. W. J.	442
Field, F.	209
Fitzsimmons, T. E.	315, 319
Flacks, C.	326
Flannagan, A.	447
Fleischer, F. C.	177
Fleming, R. A.	1, 2, 10
Fletcher, F.	35
Forman, J.	265
Forster, R. R.	1, 2, 10
Fowler, D. P.	350
Fraser, G. H.	328, 329
Fraser, J. M.	385–392
Freure, R. J.	123
Friars, G. W.	31
Fromm, H. J.	199–201
Fry, F.	374–376, 398
Fuller, G. W.	31
Fylie, A.	411
Gamula, P.	152, 153
Gardiner, J. S.	32, 38
Gibson, R.	447
Gill, P. S.	325
Glerum, C.	359
Goba, F. A.	292
Godard, H. P.	275
Godbole, E. W.	129
Golding, W.	443
Goodings, A. C.	114
Gordon, A. G.	351
Gordon, R. A.	290
Goulding, H.	316, 318
Graft, C. M.	253

Graham, N. A.	293–295
Graham, R.	282
Griffin, J. D. A.	242
Grunwell, M.	334
Gunning, J. R.	272
Guttman, H.	130
Haddow, W. R.	352
Hakka, L. E.	164
Hamilton, R. E.	289
Hampshire, F.	33
Harmelink, M. D.	198, 202–204
Harris, J. F.	179
Harrison, D.	234
Hart, J. L.	139
Hawkins, P.	90, 92
Hay, R. H.	435
Hazell, J. E.	159–161, 340
Heimburger, C.	350
Heinmiller, B.	327
Helmel, G. A.	0171
Hepburn, R. L.	412
Heybroek, C.	327
Heyland, G. R.	432
Hickling, C. D.	326
Hicks, R. L.	243, 244
Hills, G. A.	353
Hirsch, H. E.	308, 309
Hislop, T.	268
Holder, D. A.	273
Hollingbery, D. H.	265
Hollingsworth, J. B. L.	341
Holmes, B. A.	235
Holowacz, J.	354
Hopton, F. J.	112
Hore, R. C.	172, 173
Howitt, F.	276
Hudson, M. J. B.	294
Hunt, J. W.	443
Hussain, S. M.	433

Hutchins, R.	180-183
Hutchinson, A.	2, 9
Inz	148
Irvine, O. R.	34-37
Iwanusiw, O. W.	256
Jackson, H. E.	134, 135
Jaeger, F.	204
Jager, S.	77
Jermolajev, E.	401
Joe, E. G.	140, 141
Johnston, D.	411
Johnston, R. W.	72
Jones, D. E.	236-240, 259
Jones, J. N.	333
Jones, M. H.	110
Jung, F.	214
Kappes, K.	444
Keil, C.	323
Kelly, F. J.	148
Kerr, E. A.	9-11
Keyser, G. M.	241-247
Kinnibrugh, D. R.	322
Kirby, Miss E. M.	99
Knee, N. D.	451
Knight, D.	279
Knight, E. P.	149, 150
Kocher, H.	323
Kokocinski, G.	357
Kolenoski, G.	413
Kortschinski, J.	245, 246
Korzekwa, T.	269
Kramer, S.	325
Kriegler, R. J.	452
Kristianson, J.	280
Kruppa, J. H.	337
Kuntze, R. A.	89-92
Ladell, J. L.	100, 418
Lake, R. E. W.	436-438

Lang, J. G.	219
Larsen, H. R.	341
Larsen, M. L.	434
Larsson, H. C.	355
Last, A. J.	268
Laurie, G. H.	301–304
Lauriente, D. H.	441
Lawrence, P.	327
Leech, R. H.	356
Leeson, F. D.	334
Lemon, H. W.	102
Leslie, A.	205
Lewis, G. P.	305, 306
Lewis, S. E.	234
Leyland, B. K.	307, 441
Li, R.	167
Liang, S. C.	310
Liburdi, J.	295
Likuski, H.	0432, 0433
Lishchyna, L.	229
Loftus, K. H.	372, 397, 404
Lomas, H.	101, 102, 104
Lomeland, E.	444
Long, L.	96
Loughton, A.	1–3, 11
Luckham, D. G.	64, 65
Lumb, G. D.	427–431
Lumsden, H. G.	414
Lyon, N. F.	357
MacDonald, D. W.	38
MacDonald, J. A.	76
Macdonald, K. A.	343, 344
MacLeod, J. C.	392–396
Mag, T.	0171, 0172, 0174
Maher, F.	374–376, 397, 398
Manchester, D. F.	273
Manchur, G.	260–262
Mansfield, J. P.	26
Marshall, R.	327

Marsland, L. H.	335
Martin, B.	91
Martin, N. V.	392, 399–401, 406
Martin, R. B.	248
Martin, W. A.	249–251
Marton, J. P.	166–168
Matolcsy, G.	103
Mau, A.	448
McAdie, H. G.	111
McCabe, P.	151–153
McClure, R. J.	141
McCombie, A. M.	402–404
McDonald, R. D.	453
McEwen, J. K.	357
McGilvary, J. D.	143–146
McGirr, D. J.	154, 155
McGowan, J.	136
McGrath, J. T.	271
McHenry, B. L.	230, 231
McLaren, A. D.	66, 67, 73, 74
McLaren, Donna	12
McLean, N. N.	358
McManus, Elizabeth	422, 425
Meidav, S.	180, 181
Mellary, A. A.	174, 175
Melvanin, F. W.	141
Mertens, W. G.	0171, 0174
Michalski, M.	426
Millar, E.	127
Millar, R.	183
Miller, C.	280
Mills, D.	271
Mills, Mrs. I.	166
Mindreboe, K. J.	63, 68, 69
Mitchell, K. M.	255
Mitchell, R. J.	327
Mitchell, T. G.	330
Moiseev, S.	327
Moore, D.	294

Moritz, F.	333
Morphet, A. M.	18, 31
Morrison, W. D.	80–88, 177
Muehmer, J. K.	11
Mulhall, V. R.	288
Mullin, R. E.	359
Murthy, M. K.	93–96
Mustard, J. N.	252
Neil, J. H.	116–118, 421–426
Niskanen, E.	266
Nordin, H. R.	0175, 0178
Norgate, G.	432
Nunweiler, D.	290
Orr, H. L.	31
Osborne, A. D.	22, 23
O'Toole, J. J.	27, 28
Palmer, J. D.	267
Panesar, D.	330
Pang, H.	297
Parker, G. L.	254
Parker, T. J.	454
Parkinson, W. C.	17, 30
Pears, B.	325
Perlus, T. G.	97
Perrin, C. H.	0170
Perz, M. C.	240
Pfeiffer, N.	448
Phang, W.	201, 206–209
Pieczonka, W. A.	439, 440
Pierpoint, G.	353
Pikula, R.	178
Pogorski, L. A.	129, 296–299
Poling, H. E.	301, 303, 304
Pollock, F. E.	156, 157
Porteous, C.	292
Prasan, R. A.	166
Pree, D.	70
Price, B.	331, 333, 335

Prince, C.	325
Prince, L. A.	161
Prinsen, J. H.	340
Przybyla, F.	148
Puccini, D.	172, 173
Pullan, H.	432
Raissis, E. K.	319
Ramaradhy, J. M.	137, 138
Ranford, R. E.	329
Rauter, M.	350
Raycroft, G.	198
Rayfield, J. A.	315
Raymond, F. H.	360
Reckahn, J.	405
Reddering, H.	182
Redmon, N.	324
Redshaw, A. G.	175
Regier, H.	376
Reichman, J.	238, 239
Reid, S. G.	100, 104, 105
Reimer, E. M.	298
Reissmann, H. J.	1
Renzoni, C.	173
Reynolds, L. M.	106
Richards, Miss A.	167
Richardson, R. J.	327
Ricketson, C. L.	1, 3, 4, 9
Riem, R. H.	119
Ritcey, G. M.	140, 141
Roberts, J. E.	311–313
Robertson, L.	20
Ross, L. L.	299
Rothfuss, H.	330
Rowe, R.	334
Ryder, R. A.	406–410
Ryell, J.	192
Sanderson, H. T.	345, 346
Saunders, R.	436–438
Schenk, C.	117, 423, 424, 426

Schonfeld, R.	193-195
Schuld, F. W.	71
Scrimgeour, J.	289-291
Sefton, V. B.	112, 113
Sehdev, M.	319
Selby, K.	197
Seth, B.	281, 282
Shannon, J.	413
Sharp, D. A.	169
Shimizu, H. H.	300
Showalter, L. C.	338, 339
Sibul, U.	176, 177
Sierra, G.	419
Simkin, D.	412
Simo, E.	324
Simpson, C. E.	118
Simpson, K.	282
Sinclair, G. A.	361
Singh, B. A.	174-176
Singh, K. P.	162-165
Sinha, N. K.	443
Skepasts, A. V.	46-59
Small, J.	327
Smart, B. C.	142
Smeltzer, J. E.	123, 124
Smith, D. K.	420
Smith, E. R.	346
Smith, G. C.	345
Smith, J.	376, 398
Smith, L. C.	327
Smith, P.	210, 211
Sosa Lucero, J. C.	428, 429, 431
Sowa, W.	107, 108
Spiro, J. G.	125
St. George, B. C.	126
Stambolich, J.	316
Staples, M. L.	115
Stauskas, P.	326
Stein, A.	448

Stelter, M. K. G.	247
Stephenson, A. B.	415
Stermac, A. G.	196, 197
Stevenson, C. K.	60, 61, 72
Stott, G. M.	188
Stroempt, G.	361
Sugden, E. A.	100
Suggitt, J. W.	253, 254
Suter, A. C.	198
Sutherland, J. G.	277
Swamy, N. G.	325
Swans, E. V.	414
Szaplonczay, A. M.	450, 453
Szego, T.	79
Tait, J. S.	363–365
Tamagi, T.	327
Tamberg, K. G.	212–215
Taylor, J. C.	113
Teasdale, B. F.	0171, 0174
Tehrani, G.	2, 9
Thipphawong, B.	66, 67, 73, 74
Thomas, G. H. S.	109
Thorburn, G. A.	23
Tiede, H.	211
Toomver, T.	279
Torrance, Joyce	13
Treigys, J.	448
Trew, J. S.	218
Truscott, J. H. L.	14
Urban, P.	442
Vadori, M. R.	342
Van Loan, P.	94
Vanderleck, J. M.	255, 256
Viant, M.	344, 347
Vincze, L. J.	270
Wagerer, G.	323
Wainewright, F.	0173

Walker, C. R.	225–227
Walker, R. W.	336
Watkinson, D.	92
Watson, W.	257–262
Webb, G. G.	0434
Welsh, G.	168
West, G. H.	263, 264
Wherry, F. E.	321
White, P. W.	338, 339
Whittaker, D.	283
Wiebe, J.	1–3, 11
Wild, A. W.	304, 307
Wile, Mrs. I.	423
Wilkins, R.	178
Wilkinson, R. W.	142
Williams, J. R.	353
Winfield, R. G.	75, 76
Winthrop, S. O.	147
Wissiak, G. F.	128
Witty, R.	0432, 0433
Wolf, S. F.	0435
Wong, E.	110
Wright, M. M.	131, 132
Wu, J. C.	158
Wysiekierski, A. G.	293
Yakutchik, T. J.	176–178
Yan, M. M.	120, 434
Yin, S.	315
Young, W.	448
Zakaib, D. D.	124–126
Zawidzki, T. W.	139
Zubeckis, E.	15, 16
Zutrauen, S.	327

SUBJECT INDEX

As in previous editions, this index has been designed to be the basic cross-reference for any individual who wants to know what is being done in Ontario (Universities excepted) with respect to research on a particular item, idea or area. We have therefore listed all submissions to the Index under at least four headings:

- (a) the field of investigation (designated by the investigator) such as analytical chemistry, electrical engineering, metallurgy; and
- (b) materials or products, such as herbicides, power transmission, computer applications; and
- (c) identifiable objects e.g., corn, iron or sweet potatoes, concrete; and
- (d) regions such as, Georgian Bay, Ottawa River, Lake Ontario.

In addition to this listing we have selected certain key words from the description provided by the responders and have added these to this Index. For example, anyone interested in the general field of paving materials should consult the projects listed under asphalt, cement, sealing compounds, as well as test methods and measurements.

Obviously this cross-index cannot be complete so we urge any reader to use his own intelligence and skim through the final and significant part of the Index. That is the Directory of Projects starting on page 43. Here you will find, under appropriate headings, all the research, all the people, and all the points of contact you need to discover what is happening in research in the scientific and engineering fields in Ontario.

- Acoustics 317, 441
- Aerodynamics 316
- Agricultural Engineering 19, 21, 75, 76
- Alfalfa 32
- Alfalfa Strains 58

Algae 426
Algicides 423
Algonquin Park 392
Alloys 293, 295, 300, 301, 304, 307
Alumina 444
Aluminum 435
Aluminum Alloys 274–277
American Basswood 355
American Eel 369
Amino Acids 65, 82
Analytical Chemistry 126
Animal Ecology 412–415
Animal Management 71
Animal Nutrition 62, 71, 81, 85–88, 412–415, 429, 0432, 0433
Antibiotics 84
Apples 9, 25, 63
Apricots 9
Aquifers 174
Arctic Grayling 406
Asphalts 89, 121, 189, 199
Asphalt & Bituminous Paving 209
Asphaltic Concrete 89, 208

Bacteria 6, 419, 421
Bacterial Ecology 421, 422, 425
Baking 151
Barley 30, 49, 52–54, 59, 74
Barley Strains 51
Basin Studies 172
Batteries 132, 148
Bay of Quinte 366, 370, 402
Beans 68
Beaver 415
Beef 42, 0167
Beef Cattle 17, 39, 40, 42, 71
Beef Cows 62
Beets 69
Birdsfoot Trefoil 58
Black Bears 413
Black Cherry 355

- Blackfly 254
Blister Rust 350, 352
Bricks 234
Bridges — Construction 190
 — Design 212–215
 — Evaluation 214
Brome Grass 47
Brook Trout 385–391
Brook Trout Lakes 391
Buttermilk 34
- Cables — General 228
 — Underground 232, 246
Calcium Carbonate 88
Calorimetry 286
Canada Goose 414
Canadian Prairies 133
Capacitors 158
Carbohydrates 107, 109
Caribou 412
Carrots 68
Casting 307
Catalysts 111, 159
Cattle 88
Cavitation 235, 319
Cellulose 119
Cement 90, 91, 192
Central Ontario 358
Ceramics 93–96, 234, 442
Cereals 27, 28, 33, 68
Cheese 34, 36
Cheese Whey 417
Chemical & Physical Properties 89, 100, 103, 111, 114, 115, 120, 184,
 225, 271, 276, 279–282, 298, 300, 442, 443
Chemical Processing 142
Chemical Reaction Kinetics 160
Cherries 9
Chert 191
Chickens 64, 65
Chlorates 145

Chlorides 145
Chlorine 420
Chlorine Dioxide 146
Chromatography 137, 161, 199
Chrysanthemum 10
Civil Engineering 194, 195, 215
Clays 197, 222, 223
Clematis 10
Climate 171
Climatology 3, 171
Coatings 130, 131, 250, 305, 306
Coccidiosis 83
Cochrane 357
Colorimetry 97
Computer Applications 80, 169, 242, 261, 289–291, 312, 313, 331, 334, 335, 430
Concrete 186, 210, 211, 252
Concrete Pavement 210, 211
Conduction Electricity 452
Conifers 104, 356
Construction Materials 187, 191, 192, 198, 199, 201, 207–209
Continuous Casting 303
Control Mechanism 21
Control Systems 243, 289, 291, 327
Cooked Meats 0434
Corn 27, 28, 32, 33, 38, 61, 66, 67, 69, 70, 72, 76, 79
Corona 288, 321, 323, 324
Corrosion 130, 131, 200, 250, 251, 253, 267, 275, 294
Courtright 224
Coyotes 413
Crop Husbandry 27, 28, 33, 38, 77
Crop Management 60, 61
Crop Spacing 2
Crystal Growth 162, 449–451, 453
Crystal Structure 166
Crystallization 162, 453
Crystallography 266
Cucumbers 11, 69
Currants 9

- Dairy Cattle 29, 62
Dairy Products 20, 34, 36
Data Processing & Information Systems 337–339, 448
Data Transmissions Systems 320, 338, 339
Deer 412
Detergents 147, 156, 394
Die Casting 301
Dielectrics 288, 292, 323, 324, 437–439, 452
Diffraction 266
Disease Animal 83
Display Systems 445
Dolomite 91
Drainage Basins 172, 173, 176–178
Dry Cells 127
Dryeration 75
Dykes 316
- Eastern Cottonwood 355
Eastern Europe 354
Ecology 6, 351, 353, 357, 361, 409, 412–415, 419, 421
Electrical — Conduction 166–168
 — Engineering 292
 — Heating 263
 — Insulation 230, 288, 292, 298, 323, 324, 341
 — Measurements 287, 288
Electrochemistry 128, 148, 310, 328
Electrodes 145, 148
Electrolysis 145
Electrolytes 158
Electron Emmission 343
Electron Microscopy 431
Electronics 334, 336, 436–438, 440
Electronic — Ceramics 444
 — Components 329
 — Oscillators & Amplifiers 344-347
Engine Silencing 317
Entomology 70
Enzymes 0435
Epoxides 110
Eutrophication 402

Extractive Metallurgy 140, 141
Extrusion 302

Fall Wheat 61
Fats 147, 157, 0174
Fatty Acids 99, 157
Ferrites 450, 453
Ferroelectric 442
Fertilization 78
Fertilizers 1, 52–55, 57–59, 72, 133, 134, 143, 356
Fibreboard 120, 434
Fibres 103, 114, 115, 226
Field Crops 60
Field Beans 66, 67
Field Peas 50
Fire Prevention 184, 434
Fish 117, 0433
Fish Ecology 409
Fish Management 362–401, 405–407, 409, 410
Flavour 36
Flight Instruments 325, 327
Flour 149
Fluorescence 436–438
Fluorides 113, 143
Fluid Flow 314
Fly Ash 234
Foliage Utilization 104
Food 152
Food — Chemistry 147
— Mixes 152
— Preservation 14, 153
— Processing 151–154, 417
Forage Crops 55, 66, 67
Forages 27, 68
Forest — Ecology 351, 353, 357, 361
— Economics 353, 354, 356
— Management 361
— Mensuration 348, 360
— Nutrition 351, 356
— Statistics 360

- Forestry & Range Science 78
Frost Penetration 194
Fruit 1, 4, 7, 16, 24, 25
Fruit — Chemistry 16
 — Juices 15
 — Picking 23
 — Plants 9
 — Products 12, 13
 — Vegetable Products 14
Fuel Cells 322
Fuels 121

Galvanizing 305, 306
Gas — Bearing 447
 — In Metals 435
 — Turbine 317
Gelatine 0173
Generators 230, 260, 446
Genetics of Poultry 18
Geology 173–179
Geophysics 180, 181
Georgian Bay 376
Germanium Dioxide 93, 96
Gladiolus 10
Glass 443
Grain Corn 75
Grains 79, 0432
Grapes 9
Grass 32
Grass Hay 57
Greases 121
Great Lakes 171
Ground-Water 174
Groundwood 273
Grouse — Ruffed 414
 — Prairie 414
Growth Regulating Chemicals 4
Gypsum 92

Hard Maple 355

- Hay 47, 48, 58
Heat Transfer 286
Herbicides 355, 423
Hides 0435
Highway — Construction 185—187, 191, 193—196, 198, 199, 201, 206—209
 — Design 188, 194, 195, 206, 210, 215, 217
 — Management 212
 — Maintenance 200, 205
 — Safety 193, 216, 218
 — Standards 195, 215
Hogs 81
Holly 10
Horticulture 2, 26, 63
Hybrid Trout 363, 364, 398
Hydrocarbons 162
Hydrogenation 157
Hydrology 172—178

Illumination 264
Industrial Safety 227
Infrared Radiation 247
Infrared Spectroscopy 99
Insecticides 41, 254, 423
Insect Attractants 102
Instrument Design 113, 182, 183, 256, 299, 326, 330—333, 335, 336
Instrument Development 231, 232, 244, 299, 433, 0178
Insulation — Electrical 230, 288, 292, 298, 323, 324, 341
Insulators 439
Ionic Polymerization 159
Iron 220, 269
Iron Ore 269, 270
Isotopes 129, 296

Jack Pine 273

Kokanee 372, 397, 405

Lake Erie 377, 380—384, 426
Lake Huron 374—376, 378, 379, 397, 398, 405

- Lake Ontario 366–369, 371, 372, 378, 402, 426
Lake Opeongo 395, 400
Lake Trout 367, 400, 401
Lambs 45
Land Use 172
Laurentian Shield 400
Lead 132, 300, 303, 441
Leather 0435
Leghorns 18
Legume Grass 55
Lignin 98, 108
Lily 10
Limnology 376, 381, 402–404, 407, 408, 422, 425
Lipids 154
Liquid Metals 319
Lubrication 342
Luminescence 436–438

Magnesium 60, 127
Magnesium Chloride 128
Magnetic Fields 287
Magnets 446
Margarine 0174
Materials Handling 22
Measurements & Test Methods 106, 116, 129, 137, 219, 221, 230, 243, 245–247, 266, 267, 271, 288, 325, 0169, 0170
Meat 0176, 0177, 0434
Meat Processing 0175, 0178
Mechanical Engineering 286, 334
Metals 159
Metal Fatigue 271, 277
Metallurgy 127, 265, 269, 270, 276, 278, 279, 284, 285, 287, 293, 294, 300, 302, 304
Microbiology 419–421
Milk 19, 20, 37
Milk Production 35, 37
Mineral Separation 308, 309
Mining 289, 311, 312
Mink 87
Moose 412

Navigation Systems 330
Newsprint 272
Nitrogen 65, 118
North Eastern Ontario 42
Northern Ontario 178, 350, 357
Nuclear Engineering 293–295, 318, 319
Nuclear Magnetic Resonance 109
Nutrients 60
Nutrition 1, 29, 30, 62, 64, 65, 71, 81, 85–88, 351, 356, 412–415, 422, 429, 0432, 0433

Oats 49, 51, 73, 74
Oceanography 180
Odour 117
Oils 121, 123, 147, 154, 157, 0171, 0172, 0174
Oil Seeds 27, 46, 56
Olefins 340
Onions 68
Ontario 352, 353
Operations Research 311
Organic Chemistry 121–125, 147
Organo-Phosphorus 254
Ornamental Crops 1
Ornamental Plants 10, 26
Otter 415
Oyster Shell 88
Ozone 420

Paints 97, 155
Paper 100, 103, 105, 272, 290
Paper Coating 290, 433
Parasitology 377, 378, 411
Particle Accelerators 446
Pathology 428, 429
Pavements 185, 188, 189, 201, 206, 210, 211
Paving Mixtures 207
Peaches 9, 63
Pears 9
Pellet Binders 270
Pellet Binding 220

- Pelletizing 270
Peppers 11
Perennial Forages 28
Pesticides 25, 106, 423
Pet Foods 153
Petrochemicals 124, 126
Petroleum 122, 126
Petroleum Chemistry 340
Phosphates 136, 144
Phosphoric Acid 144
Phosphorous 118
Phosphorous Compounds 138
Photoconductivity 436
Physical & Chemical Properties 89, 100, 103, 111, 114, 115, 120, 184,
 225, 271, 276, 279–282, 298, 300, 442, 443
Physical Chemistry 129, 296, 297
Physical Geography 170
Phytoplankton 426
Piezoactivity 442
Piezoelectrics 445
Piles 197, 223
Plankton 399, 402
Plant Breeding 9–11, 79
Plant Morphology 418
Plastics 341
Plums 9
Polar Bears 413
Pollution — Air 112, 113
 — Control 116, 117, 423, 424
 — Water 116, 118, 416, 421
Polyethers 165, 342
Polymerization 159, 160, 163
Polymers 110, 161, 165
Poplar 350, 355
Pore Pressures 196
Potassium 135
Potatoes 11, 63, 68
Poultry 31, 83, 84
Poultry Science 64, 65, 86

Power — Conversion 326
— Distribution 228
— Sources 148
— Systems 236–242, 244, 261, 262
— Transmission 229, 232, 233, 245, 246, 257–259, 341

Predation 412, 415

Predators 413

Printing 272

Propagation 2

Protective Coatings 253

Protein 17, 43, 65, 0432, 0433

Pruning 2

Pulp 290, 100

Pyrometallurgy 141

Rapeseed 56, 0433

Raspberries 24

Red Oak 355

Red Pine 356

Reed Canary Grass 48

Reforestation & Regeneration 359

Refractory Materials 111

Resins 155

Rhododendron 10

Rhubarb 11

Rice 73, 77

River Basins 175

Rootworm 70

Ropes & Cables 226

Rubber Extender 123

St. Lawrence 369

Salt 200

Sausage 0176

Sea Lamprey 367

Sealing Compounds 185, 186

Sealing Joints 315

Sediments 422

Seismics 180

Semiconductors 167, 432, 439, 440, 449, 451, 454

Sewage 116, 118, 424
Shafts 315
Shock Tubes 318
Shortening 0174
Silage 40, 76
Silica 143
Silicon 439, 440, 451, 452
Silver Chloride 128
Silver Maple 355
Silviculture 352, 355, 357, 358
Small-Mouth Bass 374, 393, 395, 396
Smelt 377, 380-382
Smoke 0177
Smoked Meat 0177
Soaps 147, 156
Sodium Phosphate 95
Sodium Sulphate 146
Soil — Fertility 32, 38
 — Mechanics 196, 197, 221, 224
 — Science 1
Solid State 166–168, 327, 439, 440, 449, 454
Solid State Transformations 139
Sonar 334
South Bay 374–376, 379
Southern Ontario 170, 175, 361
Soybeans 28, 33, 61, 65–67, 72, 0433
Spectrometry 0170
Spectrophotometry 166
Splake 364, 398
Spraying 249
Spring Barley 72, 73
Spruce 351
Stability 248
Stainless Steel 249
Steel Metallurgy 278, 279, 283
Steel 280, 282–284, 305
Strawberries 9, 24, 69
Suckers 373
Sugar Beets 66, 69, 72

- Sugar Maple 358
Sulphur Dioxide 112
Sunflowers 46
Superconductivity 446
Surface Active Agents 101, 156
Surface Physics 168, 439
Sweet Corn 11, 69
Sweet Potatoes 11
Swine 30, 43, 44, 71, 84
Syrups 15, 355
Tantalum 329
Taste 117
Telemetering 338
Telephones 333
Test Methods & Measurements 106, 116, 129, 137, 219, 221, 230, 243,
 245–247, 266, 267, 271, 288, 325, 0169, 0170
Textiles 114, 115
Thermal Phenomena 128, 286, 292
Thermal Properties 281, 286, 342, 343, 434, 443
Timber 353
Timothy Grass 47
Tobacco 69
Tomatoes 11, 63, 69
Toxicants 388
Toxicity 249, 394, 420
Toxicology 427, 428, 430, 431
Trace Metals 0170
Traffic Studies 202–204
Transformers 229, 255, 257, 321, 324
Transistors 439, 440
Tree Breeding 350
Trees 100, 418
Trout 362–364
Turkeys 31, 82
Ultrasonic Applications 268
Ultrasonics 285
Uranium 142
Urea 164
U.S.S.R. 354

- Vacuum Packaging 0434
Vapour Liquid Equilibria 125
Vegetables 1, 4, 11
Vehicles 248
Viscosity 433

Walleye 370, 409, 410
Wastewater 116, 424
Water Pollution Control 116, 117
Waterproofing 190
Water Resources 172–178
Weed Control 33, 68, 69, 355
Welding 149, 150, 249, 274, 284, 285, 295
Wheat 51, 73, 149, 150
White Ash 355
White Beans 27, 28, 33
Whitefish 366, 376, 379
White Perch 368
White Pine 350
White Suckers 389
Wildlife 411
Windbreaks 316
Wines 8
Winter Barley 73
Winter Wheat 73
Wire Ropes 219
Wolves 413
Wood 120, 225
Wood Pulp 119, 273
Wood Properties 349

X-ray Analysis 266

Yeasts 5
Yellow Perch 373

Zinc 60, 131, 300–307, 310
Zinc Alloys 130
Zirconium 293, 295

AGRICULTURE

I

DEPARTMENT OF AGRICULTURE

Horticultural Research Institute Vineland Station, Ontario

ANDERSEN, E. T., BRADT, O. A., CLINE, R.A., COLLIN, G. H., FLEMING, R. A. FORSTER, R. R., REISSMANN, H. J., RICKETSON, C. L., WIEBE, J., LOUGHTON, A. — Studies in plant nutrition, soil management, and fertilizer use with fruit, vegetable, and ornamental crops. (24 projects)	1
ANDERSEN, E. T., BRADT, O. A., CLINE, R. A., FLEMING, R. A., FORSTER, R. R., HUTCHINSON, A., WIEBE, J., LOUGHTON, A., TEHRANI, G. — Propagation, pruning, training, spacing, and hardiness studies with horticultural crops. (30 projects)	2
ANDERSEN, E. T., CLINE, R. A., COLLIN, G. H., RICKETSON, C. L., WIEBE, J., LOUGHTON, A. — Effect of micro-climate and other environmental factors on growth and yield of selected horticultural crops. (3 projects)	3
ANDERSEN, E. T., COLLIN, G. H., RICKETSON, C. L. — Effect of growth-regulating chemicals on fruit and vegetable crops. (4 projects)	4
ADAMS, A. M. — Yeasts. (6 projects)	5
Spoilage bacteria. (3 projects)	6
COOK, FRANCES — Fruit products. (6 projects)	7
CROWTHER, R. F. — Wines. (15 projects)	8
KERR, E. A., BRADT, O. A., HUTCHINSON, A., RICKETSON, C. L., TEHRANI, G. — Breeding and variety testing of fruit plants (apple, pear, cherry, plum, peach, apricot, grape, strawberry, currant). (14 projects)	9

AGRICULTURE

KERR, E. A., FLEMING, R. A., FORSTER, R. R. — Breeding and variety testing of ornamental plants (rhododendron, holly, lily, gladiolus, clematis, outdoor chrysanthemum). (6 projects)	10
KERR, E. A., LOUGHTON, A., MUEHMER, J. K., WIEBE, J., COLLIN, G. H. — Breeding and variety testing of vegetable plants (greenhouse and outdoor tomatoes, sweet corn, greenhouse cucumbers, sweet potatoes, peppers, potatoes, rhubarb). (19 projects)	11
MCLAREN, DONNA — Fruit products. (5 projects)	12
TORRANCE, JOYCE — Fruit products. (3 projects)	13
TRUSCOTT, J. H. L. — Fruit-vegetable products and storage. (6 projects)	14
ZUBECKIS, E. — Fruit juices, concentrates, essences, and syrups. (2 projects)	15
Fruit chemistry. (4 projects)	16

Department of Agriculture Kemptville Agricultural School

BARR, G. R., PARKINSON, W. C. — A study to compare sources of protein for finishing steers	17
BARR, K., MORPHET, A. M. — Testing of strains of leghorns as a source of breeding stock	18
BEACH, M. E. — Methods of assessing the cleanliness of farm bulk coolers	19
BEACH, M. E., ROBERTSON, L. — A comparison of three resazurin test methods with the standard plate count as a means of assessing the sanitary quality of industrial milk held in bulk coolers	20
CLARK, J. H. — Automatic control of towed self-propelled wagon	21
CLARK, J. H., OSBORNE, A. D. — Mechanization of horizontal silo operations	22

AGRICULTURE

CLARK, J. H., OSBORNE, A. D., THORBURN, G. A. — Mechanization of apple-picking — mechanical method of transporting pickers and mechanized movement of apples from pickers to boxes or bins	23
CLASS, R. E. — Strawberry and raspberry yield trials	24
Apple orchard pesticide use	25
CLASS, R. E., MANSFIELD, J. P. — Ornamental plant propagation and area adaptation study	26
CURTIS, J. D., O'TOOLE, J. J. — Evaluation of variety testing of annual and perennial forages, oil seeds, cereals, white beans, and corn	27
Evaluation of crop production techniques involving cereals, annual and perennial forages, corn, soybeans and white beans	28
DALRYMPLE, J. A. — A study to determine mineral requirements for growing dairy heifers, and to determine whether they have a pref- erence as shown by free choice feeding	29
DALRYMPLE, J. A., PARKINSON, W. C. — The effect of high moisture and conventional barley on growth, feed efficiency, and carcass merit of swine	30
FRIARS, G. W. ¹ , MORPHET, A., FULLER, G. W., ORR, H. L. — Quantita- tive genetics of turkeys. (Diallel crosses in broilers)	31
GARDINER, J. S. — Fertility requirements of field crops in corn, alfalfa, and grass, as they effect establishment, yield, and survival	32
HAMPSHIRE, F., CURTIS, J. D. — Weed control studies in field crops (corn, cereals, soybeans, and white beans)	33
IRVINE, O. R., BURNETT, K. A. — The effect of standardizing milk for manufacture into cheddar cheese with additions of sweet butter- milk	34
IRVINE, O. R., FLETCHER, F. — Application of mastitis screening tests to dairy herd / improvement association milk samples	35

¹ University of Guelph.

AGRICULTURE

IRVINE, O. R., BURNETT, K. A. — Acetaldehyde production by lactic starters as a possible cause of fruity flavour in cheddar cheese	36
Fat acid values of raw milk stored or handled in cans, bulk coolers or through pipeline systems	37
MACDONALD, D. W., GARDINER, J. S. — Minimum tillage of corn	38

Ontario Demonstration Farm New Liskeard, Ontario

BUTLER, J. D., BURGESS, T. D. ¹ — The genetic improvement of beef cattle through the use of performance tested sires	39
BUTLER, J. D. — Whole plant barley silage and its utilization in finishing rations for beef cattle	40
Warble-fly control: through the use of systematic insecticides	41
Minimum housing feeding and management of beef brood cows under North Eastern Ontario winter conditions	42
Protein and T.D.N. levels in swine rations from post-weaning to market weight	43
Restricted vs. full feeding of swine	44
Early weaning and confinement feeding of market lambs	45
SKEPASTS, A. V. — Evaluation of sunflower varieties and strains for oil seed production ²	46
Evaluation and comparison of Timothy and Brome grass varieties and strains for dry matter production under hay management ³	47
Evaluation and comparison of Reed Canary grass varieties and strains for dry matter production under hay and pasture management ³	48
Comparative adaptation of licensed oat and barley varieties ⁴	49
Evaluation and comparison of field pea varieties ⁴	50
Comparative adaptation and evaluation of late generations of oat, wheat, and barley strains ⁴	51

¹ University of Guelph.

² Co-operative project: Federal and Provincial Stations.

³ Ontario Forage Committee.

⁴ Ontario Cereal Committee.

AGRICULTURE

Responses of certain European barley varieties to various levels of nitrogen fertilizers	52
Effect of various rates of nitrogen and phosphorous on barley yield and other agronomic characteristics	53
Barley yield responses to various ratios of N, P, and K	54
Effect of various rates of P and K on DM yield, stand, and botanical composition of a certain legume grass mixture	55
Evaluation and comparison of seed Rape varieties for oil production ¹	56
The effect of rates and time of application of nitrogen on yield of grass hay	57
The evaluation and comparison of Birdsfoot Trefoil and Alfalfa strains and varieties for DM production under hay management ²	58
The effects of rates and time of application of nitrogenous fertilizer on certain barley varieties	59

**Western Ontario Agricultural School
Ridgetown, Ontario**

BALDWIN, C. S., STEVENSON, C. K. — Studies with trace elements and secondary nutrients (with particular emphasis on zinc and magnesium) on the growth yield of field crops. (3 projects)	60
Rotation, row-width, population, residual effects and past management studies on corn, soybeans, and fall wheat. (7 projects)	61
BEATTIE, D. — Evaluation of feeds: feed storage, feed additives, and management practices with dairy cattle and beef cows	62
BROWN, R. H., MINDREBOE, K. J. — Variety testing of horticultural crops (fall and spring hot house tomatoes, potatoes, peaches, apples). (5 projects)	63
LUCKHAM, D. G. — Evaluation of several feeding regimes for egg-type and meat-type laying hens and their effect on growth and reproductive performance	64

¹ Co-operative project: Federal and Provincial.

² Ontario Forage Committee.

AGRICULTURE

LUCKMAN, D. G. — Studies of the protein requirements of chicken broilers, roasters and laying hens.	
Broilers and Roasters: Protein level in least-cost rations made up by varying grain and soybean meal.	55
Laying Hens: Protein requirements; supplementation of low protein laying diets with non-protein nitrogen and amino acids	55
MCLAREN, A. D., THIPPHAWONG, B. — The evaluation of lines, strains, and varieties of forage crops, sugar beets, grain corn, field beans, and soybeans. (31 projects)	66
Evaluation and comparison of cultural practices and management of field corn, soybeans, field beans, and forage crops. (8 projects)	67
MINDREBOE, K. J., BROWN, R. H. — Weed control studies in bean crops, potatoes, cereals, forages, carrots, and onions. (40 projects)	68
Weed control studies in field corn, sugar beets, tomatoes, tobacco, cucumbers, sweet corn, strawberries. (30 projects)	69
PREE, D., BALDWIN, C. S. — Studies in the control of the northern corn rootworm in field corn and insects in orchard crops	70
SCHULD, F. W. — Evaluation of feedstuffs, feed additives, and management practices for beef cattle and swine	71
STEVENSON, C. K., BALDWIN, C. S., JOHNSTON, R. W. — Time, rate, and method of application of nitrogen, phosphorus, and potassium on the growth, yield and quality of corn, sugar beets, spring barley, and soybeans. (15 projects)	72
THIPPHAWONG, B., MCLAREN, A. D. — Evaluation of lines, strains, and varieties of winter barley, winter wheat, spring barley, oats, wheat, and rice. (25 projects)	73
Evaluation of cultural practices involving seed sizes and seeding rates of oats and barley. (2 projects)	74
WINFIELD, R. G. — Factors affecting "dryeration" of grain corn	75
WINFIELD, R. G., MACDONALD, J. A., BEATTIE, D. — Harvesting and storing corn stover silage	76

**Ontario Research Foundation
Department of Physiography**

CHAPMAN, L. J., JAGER, S. — Rice growing test	77
---	----

**Cominco
Trail, B.C.**

BEATON, J. D. — Forest and range fertilization	78
--	----

**Maple Leaf Mills Ltd.
Hogg and Lytle Seeds**

SZEGO, T. — Development of new species of corn and other varieties of grains	79
--	----

**Maple Leaf Mills Limited
Agricultural Division**

MORRISON, W. D. — The use of the IBM 1130 computer for formulating experimental and commercial rations	80
--	----

The effect of nutrient density of the ration on various economic factors in hog production	81
--	----

The effect of altered amino acid balance on turkeys at various stages of growth, with particular emphasis on lysine and male turkeys	82
--	----

MORRISON, W. W., FERGUSON, A. E. ¹ — The efficacy of various drugs against experimentally induced coccidiosis of chickens	83
--	----

MORRISON, W. D. — The screening of new and old anti-biotics for growth promotion activity in swine and poultry	84
--	----

Investigations of nutrient availability (biological) from ingredients from new or different sources, including regional aspects	85
---	----

Management and housing factors as they influence nutrient requirements of growing pullets and laying hens	86
---	----

¹ University of Guelph.

AGRICULTURE

MORRISON, W. D., BOWNESS, E. R. — Further study on the development of a complete ration for mink	87
MORRISON, W. D. — Studies on the nutrient requirement of growing steers, and the replacement of roughage with calcium carbonate (oyster shell)	88

CHEMISTRY

II

**Ontario Research Foundation
Department of Materials Chemistry**

KUNTZE, R. A., BROWN, E. C. — Correlation between chemical composition and adhesive properties of asphalt	89
KUNTZE, R. A., HAWKINS, P. — False set of Portland cement	90
KUNTZE, R. A., MARTIN, B. — A study of the suitability of dolomite for the manufacture of Portland cement	91
KUNTZE, R. A., HAWKINS, P., WATKINSON, D. — The chemistry of gypsum and its dehydration products	92
MURTHY, M. K. — Thick-film conductive and resistive elements based on Germanium Dioxide glasses	93
MURTHY, M. K., VAN LOAN, P. — Synthesis and properties of beta-alumina type compounds	94
MURTHY, M. K., EL ASSAL, K. — Mechanism of nucleation and kinetics of crystallization in sodium phosphate glasses	95
MURTHY, M. K., LONG, L. — Properties and structure of glasses based on Germanium Dioxide	96
PERLUS, T. G., DI VALENTIN, MRS. C. — Correlating objective instrumental color differences with subjective color difference appreciation on a paint industry wide basis	97

**Ontario Research Foundation
Department of Organic Chemistry**

DAS, B. S. — A study of formaldehyde lignin	98
KIRBY, MISS E. M. — Infrared spectroscopy of fatty acids	99
LADELL, J. L., SUGDEN, E. A., REID, S. G., BRAJSA, MISS B. — A study of important Ontario tree species in relation to their use for pulp and paper production	100
LOMAS, H. — The chemistry of organic surface-active agents	101

CHEMISTRY

LOMAS, H., LEMON, H. W. — The chemistry of insect attractants	102
MATOLCSY, G. — A study of the relationship of fibre characteristics and the properties of paper	103
REID, S. G., CROUTCH, V. K., LOMAS, H. — A study of the utilization of conifer foliage	104
REID, S. G., BRAJSA, MISS B. — A study of the absorption of liquids by paper	105
REYNOLDS, L. M. — The development of improved methods for de- termination of pesticide residues in plants and animals	106
SOWA, W. — The development of improved methods of synthesis of carbohydrates	107
The chemistry of lignin	108
THOMAS, G. H. S. — The study of the structure of carbohydrates by nuclear magnetic resonance	109

Ontario Research Foundation Department of Physical Chemistry

JONES, M. H., WONG, E. — Synthesis of fluorinated epoxides and re- lated polymers	110
MCADIE, H. G. — Preparation of expanded refractory materials with potential as catalysts	111
SEFTON, V. B., HOPTON, F. J. — Recovery of sulphur valves from gaseous effluents containing sulphur dioxide	112
SEFTON, V. B., TAYLOR, J. C. — Development of a continuous analyser for atmospheric fluorides	113

Ontario Research Foundation Department of Textile Research

GOODINGS, A. C. — Structural modification of wool and hair to ex- ploit changes in the fibre which can be induced chemically, with particular reference to rigidity and ease of extension	114
STAPLES, M. L., CAMPBELL, H. J. — Chemical modification of cellu- losic fibres to improve existing properties of fabrics, with par- ticular reference to crease resistant qualities	115

**Ontario Water Resources Commission
Laboratories Division**

NEIL, J., DIOSADY, P., BISHOP, J. — Application of atomic absorption spectrophotometry to determination of trace elements in water and wastewater	116
NEIL, J., SCHENK, C., DIOSADY, P., BERG, W. — Determination of the odour and taste-causing substances in fish, Dowtherm in fish	117
NEIL, J., SIMPSON, C. E. — Application of technicon Auto-Analyser equipment to the automatic chemical analysis of water, sewage, and industrial wastes	118

Abitibi Paper Co. Ltd.

RIEM, R. H. — Identification of colour progenitors in high-yield pulps	119
YAN, M. M., BALDWIN, S. H. — Medium density fibreboard	120

British American Oil Co. Ltd.

CASHMORE, K. — Research into the properties, formulations, and applications of fuels, greases, asphalts, and lubricating oils	121
CASHMORE, K., BAYS, N. — Studies of hydrogenation processes applied to petroleum	122
SMELTZER, J. E., FREURE, R. J. — Development of a Canadian source of rubber extender and process oils	123
ZAKAIB, D. D., SMELTZER, J. E. — Research in petrochemicals and specialty products	124
ZAKAIB, D. D., SPIRO, J. G. — Studies of vapour-liquid equilibria of various multi-phase systems	125
ZAKAIB, D. D., ST. GEORGE, B. C. — Research into the composition of petroleum and petrochemicals using modern analytical chemistry techniques	126

Burgess Battery Company

CAMPBELL, G., ADAMS, R., MILLAR, E. — Research into the method of producing magnesium cans for use in the making of primary dry cells	127
---	-----

CHEMISTRY

- CAMPBELL, G., WISSIAK, G. F. — Development of greater temperature range of operation of magnesium/silver chloride battery systems 128

Chemical Projects Ltd.

- POGORSKI, L. A., GODBOLE, E. W. — Precise measurements of isotopic ratios by mass spectrometric techniques 129

Cominco Sheridan Park

- GUTTMAN, H. — Corrosion 130
WRIGHT, M. M. — Clear conversion coatings for zinc 131
Lead-acid battery plates, curing studies 132

Cominco Trail, B.C.

- BEATON, J. D. — Study of micronutrient deficiency on the Canadian prairies 133
JACKSON, H. E. — Caking of fertilizers including fertilizer conditioner improvements 134
Evaluation of various potassium compounds 135
McGOWAN, J. — Evaluation of phosphate rocks 136
RAMARADHYA, J. M. — Development of new methods of analysis for use in gas chromatography 137
Study of phosphorous compounds 138

Eldorado Mining & Refining Ltd.

- HART, J. L., ZAWIDZKI, T. W., BROOKE, K. — Hot pressing investigations 139
JOE, E. G., RITCEY, G. M. — Recovery of high purity metals from ores and concentrates 140
MELVANIN, F. W., CRAIGEN, W. J. S., MCCLURE, R. J., RITCEY, G. M., JOE, E. G., CONN, K. — Production of ductile zirconium metal from zircon sand 141
SMART, B. C., WILKINSON, R. W. — Improvements in production methods for uranium compounds 142

CHEMISTRY

Electric Reduction Company of Canada Ltd.

McGILVARY, J. D. — An investigation of the utilization of by-product fluorides and finely divided silica from fertilizer manufacturing operations	143
The purification of wet-process phosphoric acid by high temperature distillation techniques to make acid suitable for industrial phosphates	144
An investigation of the various electrode materials for use in the electrolysis of chlorides to form chlorates	145
Development of a new generation process for chlorine dioxide in which sodium sulphate is obtained as a usable by-product	146

Lever Brothers Ltd.

WINTHROP, S. O. — Investigations in the fields of oils, fats, soaps and detergents	147
--	-----

Mallory Battery Company of Canada Ltd.

KELLY, F. J., PRZYBYLA, F., INZ — Low temperature characteristics of alkaline primary (electrochemical) systems	148
---	-----

Maple Leaf Mills Ltd. Research Division

KNIGHT, E. P. — Development of industrial uses for wheat flour	149
Study of fine grinding and air classification of wheat flour	150
MCCABE, P., DYCK, P. J. — Development of new baking processes	151
MCCABE, P., DYCK, P. J., GAMULA, P. — Development of convenience foods and food mixes	152
MCCABE, P., GAMULA, P. — Studies in pet food processing and development of new pet foods	153
McGIRR, D. J. — Studies in vegetable oil processing and development of new uses for vegetable oils	154
Development of water-thinnable paint resins	155

Procter and Gamble Company

POLLOCK, F. E. — Technology of soaps and synthetic detergents	156
Technology of edible fats and oils	157

CHEMISTRY

Sprague Electric of Canada Ltd.

BURGER, F. J., WU, J. C. — Electrolyte systems for electrolytic capacitors	158
--	-----

Union Carbide Canada Ltd.

BATA, G. L., HAZELL, J. E. — Transition metal complex catalysts in ionic polymerization	159
High pressure polymerization kinetics	160
BATA, G. L., HAZELL, J. E., PRINCE, L. A. — Polydispersity determinations by chromatography techniques	161
BATA, G. L., SINGH, K. P. — Crystallization rates of hydrocarbons	162
Free radical copolymerization of non-vinyl type Monomers	163
BATA, G. L., SINGH, K. P., HAKKA, L. E. — Chemistry of cyclic urea derivatives	164
BATA, G. L., SINGH, K. P., ANDREJCHYSHYN, W. M. — Structure of polyethers	165

Welwyn Canada Ltd.

MARTON, J. P., BENINGER, D. J., PRASAN, R. A., MILLS, MRS. I. — Research on thin films of electroless Ni-P alloys	166
MARTON, J. P., LI, R., RICHARDS, MISS A. — Electrical conduction in Group V semiconductors	167
MARTON, J. P., CHIN, F. K., WELSH, G. — Investigation of metallic field effects	168

Canada Packers Limited

BURKE, T. — The measurement of beef tenderness	0169
PERRIN, C. H. — Analysis of trace metals by means of atomic absorption spectrometer	0170
TEASDALE, B. F., MERTENS, W. G., HELMEL, G. A., MAG, T. — Study of unit processes in edible oil technology	0171
MAG, T. — The study of operations in an edible oil refinery	0172

CHEMISTRY

ESLINGER, M. J., WAINEWRIGHT, F. — Gelatine manufacturing processes	0173
TEASDALE, B. F., MERTENS, W. G., MAG, T. — The utilization of fats and oils in the manufacture of margarine, shortening, salad oils and frying fats	0174
DUTKEWYCH, E., NORDIN, H. R. — Continuous processes in the meat industry	0175
BURKE, T. — Evaluation of binders in sausage products	0176
The use of liquid smoke in meat products	0177
NORDIN, H. R. — Machine for pickle injection of bone-in meat cuts ...	0178

EARTH SCIENCES
III

**Department of Energy and Resources Management
Energy Branch**

- DE PAZ, J. F., SHARP, D. A., BRIGHAM, R. J.¹ — Ontario well data computer project 169

**Ontario Research Foundation
Department of Physiography**

- CHAPMAN, L. J. — Revision of physiographic map of Southern Ontario 170
Influence of the Great Lakes on the climate of adjoining lands² 171

**Ontario Water Resources Commission
Water Resources Division**

- HORE, R. C., PUCCINI, D. — Experimental Basin Studies: The effect of changes in land use are being studied on the hydrologic regimen in small drainage basins 172
- HORE, R. C., PUCCINI, D., RENZONI, C., BAROUCH, M. — Representative Basin Studies: Under the IHD program, all aspects of the water balance are being studied in five drainage basins representative of different geomorphologic regions in Southern Ontario 173
- SINGH, B. A., MELLARY, A. A. — Groundwater Assessment under the IHD program, test-drilling and test-pumping programs to determine the hydraulic characteristics of various aquifers and to help assess the groundwater resources potential in Ontario 174
- SINGH, B. A., CHOO-YING, A., MELLARY, A. A., REDSHAW, A. G. — Synoptic Water Resources Survey of Southern Ontario: A study of selected river basins in Southern Ontario to determine the correlation of stream flows among basins of similar climatic and geomorphologic characteristics 175

¹ University of Western Ontario.

² In cooperation with the Meteorological Branch, Department of Transport, Ottawa.

EARTH SCIENCES

YAKUTCHIK, T. J., SINGH, B. A., SIBUL, U. — Water Resources Survey of the Big Creek Drainage Basin	176
YAKUTCHIK, T. J., SIBUL, U., FLEISCHER, F. C., MORRISON, W. D. — Water Resources Survey of the Big Otter Creek Drainage Basin	177
YAKUTCHIK, T. J., PIKULA, R., WILKINS, R., DUCKWORTH, P. — Water Resources Survey of the Albany River Drainage Basin in con- junction with a Water Resources Survey of Northern Ontario	178

Cominco Trail, B.C.

HARRIS, J. F. — Geological research	179
---	-----

Huntec Limited

HUTCHINS, R., MEIDAV, S. — Underwater seismics	180
Seismic sequel processing ¹	181
HUTCHINS, R., REDDERING, H. — Electromagnetic induction mineral prospecting system ²	182
HUTCHINS, R., MILLAR, R. — Induced polarization mineral pros- pecting system ²	183

¹ Defence Industrial Research Grant. — D.R.B.

² Cost sharing loan, Department of Industry, Ottawa.

ENGINEERING

IV

**Department of Attorney General
Office of the Fire Marshal**

BRYAN, D. M. — Determination of fire hazard characteristics of materials	184
--	-----

**Department of Highways
Materials and Testing Division**

CHOJNACKI, B. — Performance of sealing compounds for joints in rigid pavements	185
Evaluation of concrete curing and sealing compounds	186
Investigation of alkali-reactivity of Ontario aggregates	187
CHONG, G., STOTT, G. M. — Evaluation of municipal streets and roads	188
CORKILL, J. T. — Factors affecting the performance of asphalt pavements	189
Bridge deck waterproofing systems	190
DUNIKOWSKA, Z. — Classification of chert	191
RYELL, J. — Effect of cement characteristics on the performance of admixtures in Portland cement concrete	192
SCHONFELD, R. — Factors affecting skid resistance of highway pavements	193
Frost penetration control	194
Quality control of embankments and granular bases	195
STERMAC, A. G., BARSVARY, A. — Long term observation of pore pressures in settlements beneath highway embankments	196
STERMAC, A. G., SELBY, K. — Bearing capacity of friction piles in stiff clays	197
SUTER, A. C., HARMELINK, M. D., RAYCROFT, G. — All-weather lane markings for highways	198

ENGINEERING

Department of Highways Research Branch

FROMM, H. J. — Chromatographic analysis of paving asphalts	199
Evaluation of corrosion for use in salt used for winter maintenance of highways	200
FROMM, H. J., PHANG, W. — Investigation of cracking of flexible pavements	201
HARMELINK, M. D. — Sampling procedures used in origin-destination studies	202
The estimation of annual average daily traffic and design hour volumes from the results of short surveys	203
HARMELINK, M. D., JAEGER, F., DE VALENCE, P. — Multipath traffic assignment program development	204
LESLIE, A. — A study of highway maintenance management	205
PHANG, W. — A full-scale bases and surfacings experiment on Highway 10, Brampton	206
Use of fillers in bituminous paving mixtures	207
Effect of additives on coating and stripping of asphaltic concrete ..	208
PHANG, W., FIELD, F. — A study of thin bituminous overlays: design and performance	209
SMITH, P. — Joint design for concrete pavements	210
SMITH, P., TIEDE, H. — Concrete pavement performance study	211
TAMBERG, K. G. — Economic significance of vehicle load limitation	212
Optimum weight analysis for composite bridges	213
TAMBERG, K. G., JUNG, F., CSAGOLY, P. — Development of vehicle load parameters for use in bridge design and evaluation	214
TAMBERG, K. G. — Bridge Design Loads	215

Department of Highways Road Design Division

FARREN, D. W. — Highway illumination methods and standards	216
Development of safe side slopes for highways	217

ENGINEERING

Department of Highways Traffic and Planning Studies Division

TREW, J. S. — Flashing beacons on stop signs	218
--	-----

Department of Mines Mines Inspection Branch

BARRETT, C. M., LANG, J. G. — Non-destructive testing of wire ropes	219
CAVANAGH, R. L. ¹ — Investigation of iron pellet binding	220

Hydro Electric Power Commission of Ontario Research Division

ADAMS, J. I. — Determination of the anisotropic properties of soils by correlation of the results of in-situ horizontal-plate bearing tests with those of laboratory tests on horizontal and vertical samples	221
The in-situ measurement of horizontal movement and vertical heave of soft clay, caused by deep excavation	222
A study and analysis of the driving performance and loading behaviour of instrumented pipe and H-section piles driven to a depth of about 140 feet in soft clay	223
A detailed study of the geological history, structure, and engineering properties of the post-glacial lake deposits near Courtright, Ontario	224
BROWN, T. A., WALKER, C. R. — Study of the strength of full-size wood poles, and correlation with laboratory test data from small specimens	225
Study of the properties and application of synthetic fibre ropes	226
Study of protective headgear	227
CAMERON, A. W. W. — Study of service aging of distribution cables	228
CAMERON, A. W. W., LISHCHYNA, L. — Studies of surge transfer through transformers	229

¹ Ontario Research Foundation.

ENGINEERING

CAMERON, A. W. W., McHENRY, B. L. — Development of improved automated method of crack detection for the insulation of large rotary machines	230
Development of improved potential indicators for the use by linemen and maintenance men	231
CASSAN, J. G., BALJET, A. F. — Methods for locating oil and gas leaks in underground cable circuits	232
Applications of artificial cooling to underground high-voltage cables	233
HARRISON, D., LEWIS, S. E. — Use of fly ash for brick making	234
HOLMES, B. A. — Study of cavitation-pitting resistance of metals and alloys	235
JONES, D. E. — Use of power line carrier to determine desirability of automatic line reclosing after a line fault	236
JONES, D. E., BOZOKI, B. — Frequency-shift carrier relaying equipment: study of alignment procedures and of response in presence of noise	237
JONES, D. E., REICHMAN, J. — Study of radio and television interference problems from EHV, HV and LV power lines	238
Application of power line carrier to lower voltage lines	239
JONES, D. E., PERZ, M. C., BOZOKI, B. — Carrier frequency studies on high-voltage lines: propagation, attenuation, channel isolation, coupling, and operation during faults	240
KEYSER, G. M., BROWN, R. D. — Development of power system protective relays using electronic techniques	241
KEYSER, G. M., GRIFFIN, J. D. A. — Application of small digital computers to on-line protection and control of power systems	242
KEYSER, G. M., HICKS, R. L. — Study and measurement of electrical interference on signal and control circuits in large power stations	243
Development of thunderstorm detectors suitable for use in stations	244
KEYSER, G. M., KORTSCHINSKI, J. — Remote detection of icing and galloping on transmission lines	245
Location of hot spots in underground cables	246

ENGINEERING

KEYSER, G. M., STELTER, M. K. G. — Remote temperature measurements on high-voltage apparatus by means of infrared radiation	247
MARTIN, R. B. — Studies of the physical stability of vehicles and construction equipment	248
MARTIN, W. A. — Studies of toxicity of fumes from the spraying and welding of stainless steel	249
Long-term study of atmospheric corrosion of metals and metallic coatings	250
Long-term study of aqueous corrosion of metals and metallic coatings	251
MUSTARD, J. N., CLENDENNING, T. G., BEAUDOIN, J. J. — Study of various laboratory procedures for evaluation of freeze-thaw resistance of concrete in service	252
SUGGIT, J. W., GRAFT, C. M. — Laboratory and field evaluations of non-metallic protective coatings for underground steel	253
SUGGIT, J. W., PARKER, G. L. — Studies of organo-phosphorus larvicides for blackfly control	254
VANDERLECK, J. M., MITCHELL, K. M. — Accuracy stability of capacitor voltage transformers	255
VANDERLECK, J. M., IWANUSIW, O. W. — Influence of transportation on the accuracy of watthour meters	256
WATSON, W. — Analogue study of over voltages at neutrals of ungrounded 230-kv transformers	257
Measurement and analysis of switching surges on 500-kv transmission lines	258
WATSON, W., JONES, D. E. — Development of solid state high-speed protective relay systems	259
WATSON, W., MANCHUR, G. — Development of accurate methods to measure speed variation of large hydro generators under transient conditions, and application of resulting signals to stabilizing control	260
Studies of behaviour of large interconnected electric power systems, including effects of governors and computer studies of voltage regulator effects	261
Studies of effects of electric-arc furnaces on power systems	262

ENGINEERING

WEST, G. H. — Development of design methods for commercial water heating systems	263
WEST, G. H., DAVIDSON, G. E. — Performance of fluorescent street-lighting luminaires under a wide range of ambient temperatures	264

Ontario Research Foundation Department of Engineering and Metallurgy

CAVANAGH, R. L., HOLLINGBERY, D. H., FORMAN, J. — High temperature flame processing	265
CAVANAGH, R. L., NISKANEN, E. — X-ray labs: Development and application of specialized analytical X-ray techniques	266
CAVANAGH, R. L., PALMER, J. D. — Accelerated corrosion test methods: Development of improved methods	267
CAVANAGH, R. L., LAST, A. J., HISLOP, T. — Ultrasonic applications: Research and development in the use of ultrasonic energy in processing in various industrial fields	268
CAVANAGH, R. L., KORZEKWA, T. — Ferrous metallurgy research: Development of new ideas, processes in fields of process metallurgy, and ore dressing	269
CAVANAGH, R. L., VINCZE, L. J. — Investigation of pellet binders for iron ore concentrates	270
CAVANAGH, R. L., BRATINA, W. J., MCGRATH, J. T., MILLS, D. — Metal physics research: Study of deformation of metals (e.g. fatigue) by non-destructive techniques	271

Abitibi Paper Co. Ltd.

GUNNING, J. R. — Newsprint for web-offset printing	272
MANCHESTER, D. F., HOLDER, D. A. — Refiner groundwood from jack pine	273

Aluminum Laboratories Ltd.

CORNEIL, R. B. — Influence of shielding gas composition on the MIG machine welding speed of aluminum alloys	274
---	-----

ENGINEERING

GODARD, H. P. — Long-term exposure of aluminum alloys in natural environment	275
HOWITT, F. — The recovery and recrystallization behaviour of aluminum alloys	276
SUTHERLAND, J. G. — Static and fatigue behaviour of aluminum alloys	277

Atlas Steels Company

CROSSLAND, K. — Development of vacuum arc melted grades of alloy steel	278
KNIGHT, D., TOOMVER, T. — Investigation of chemical and metallurgical factors influencing machinability of stainless steel	279
KRISTIANSON, J., MILLER, C. — Investigation of the formability of stainless steel	280
SETH, B. — Evaluation of thermal fatigue resistance of materials and development of superior die materials for die casting of bars	281
SETH, B., GRAHAM, R., SIMPSON, K. — Development of high speed quality tool steels	282
WHITTAKER, D. — Development of an improved remelting process for quality alloy steels	283

Canadian General Electric Co. Ltd.

BRADSTREET, B. J. — Exploration of defects associated with high speed automatic welding of mild steel	284
The ultrasonic examination of structural steel wdds.	285
ELGAR, E. C. — Application of calorimetric techniques to the determination of local losses in electrical apparatus	286
ELLIS, J. R., BRIGGS, H. A., BEEVERS, C. L. — Measurement of losses in silicon steel at high densities and with controllable complex wave form	287
MULHALL, V. R., ATKINSON, E. A. — Evaluation of corona endurance capabilities of insulating systems	288

ENGINEERING

SCRIMGEOUR, J., HAMILTON, R. E. — Analytical investigation of processes in the mining industry to develop mathematical models and control strategies for computer control of selected processes	289
SCRIMGEOUR, J., NUNWEILER, D., GORDON, R. A. — Analytical investigation of processes in the pulp and paper industry to develop mathematical models and control strategies for computer control of the continuous digester, bleach plant and paper machine	290
SCRIMGEOUR, J., BUTLER, R. E. — Systems design for direct digital control	291

Canadian Westinghouse Company Ltd.

GOBA, F. A., CLARK, F. A., PORTEOUS, C. — Studies on aging of electrical insulation under thermal and electrical stress	292
GRAHAM, N. A., DIXON, P. R., DALAL, K., WYSIEKERSKI, A. G. — Research and development on alloys of zirconium	293
GRAHAM, N. A., HUDSON, M. J. B., MOORE, D., ADAMSON, F. — Studies on corrosion of materials used in nuclear reactor construction	294
GRAHAM, N. A., LIBURDI, J. — Research and development on methods of joining zirconium and its alloys	295

Chemical Projects Ltd.

POGORSKI, L. A., BASMADJIAN, D. — Large and small scale separation and recovery of stable isotopes	296
POGORSKI, L. A., PANG, H. — Study of the phase equilibria of multi-component systems	297
POGORSKI, L. A., REIMER, E. M. — Development of superinsulations ¹	298
POGORSKI, L. A., ROSS, L. L. — Development of miniature cryogenic refrigerators ¹	299

Cominco Sheridan Park

BROWN, J. A., SHIMIZU, H. H. — Physical metallurgy of lead and zinc alloys	300
--	-----

¹ Jointly sponsored by National Research Council.

ENGINEERING

LAURIE, G. H., POLING, H. E. — Zinc alloy die casting	301
LAURIE, G. H. — Zinc extrusion	302
LAURIE, G. H., POLING, H. E. — Continuous casting	303
LAURIE, G. H., POLING, H. E., WILD, A. W. — Fabrication of zinc alloy products	304
LEWIS, G. P. — Mechanical properties of galvanized steel	305
Hot dip galvanizing	306
LEYLAND, B. K., WILD, A. W. — Zinc gravity casting alloys	307

Cominco Trail, B.C.

HIRSCH, H. E. — Research on flotation chemistry	308
Research on ore beneficiation	309
LIANG, S. C. — Research on zinc electrolysis	310
ROBERTS, J. E. — Operations research studies for mining and operating plants	311
Computer programming of production and distribution of metals and chemical products	312
Application of mathematical and computer techniques to technological problems	313

Dilworth, Secord, Meagher & Associates

BELL, R. P. — Analysis of mechanics of two-phase fluid flow	314
BILLINGTON, I. J., FITZSIMMONS, T. E., RAYFIELD, J. A., YIN, S. — Research related to the operation of controlled leakage seals for rotating shafts ¹	315
BILLINGTON, I. J., GOULDING, H., STAMBOLICH, J. — Aerodynamics of dykes and windbreaks ²	316
BILLINGTON, I. J., BELL, R. P. — Gas turbine engine silencing ³	317
BREMNER, G. F., GOULDING, H. — Explosive decompression of high enthalpy water ⁴	318

¹ On behalf of Champlain Power Projects Ltd.

² On behalf of the St. Lawrence Seaway Authorities.

³ On behalf of Continental Aviation and Engineering Corp.

⁴ On behalf of Atomic Energy of Canada Ltd.

ENGINEERING

FITZSIMMONS, T. E., DALRYMPLE, D., RAISSIS, E. K., SEHDEV, M. — Studies related to the flow of high temperature Pb-Bi eutectic ¹	319
Ferranti Packard Electric Ltd.	
BELAK, M. J. — Communications systems with time spreading features to reduce impulse noise and network synthesis	320
BOHDANOWICZ, A. B., WHERRY, F. E. — Development of method of calculating internal corona inception or gassing voltage at any point in an oil filled transformer	321
DAVIS, H. J., KINNIBRUGH, D. R. — High temperature molten carbon- ate hydrocarbon fuel cells	322
KEIL, C., KOCHER, H., WAGERER, G. — Development of hypothesis for prediction of corona inception in insulation structures of oil and oil impregnated paper during power frequency, impulse and switching surge tests	323
SIMO, E., REDMON, N. — The effect of drying and degassing of trans- former insulations (including oil) on the point of corona incep- tion during dielectric tests	324
Garrett Manufacturing Ltd.	
ATKINSON, B. W., GILL, P. S., PEARS, B., ABRAHAMSOHN, G., BISSET, H. A., PRINCE, C., SWAMY, N. G., KRAMER, S., DEAN, M. — Flight instrument test sets: To develop self-contained flight in- strument test sets, manually and automatically controlled, which provide highly accurate and stable static and total pressures to simulate aircraft flight conditions on the ground	325
HICKLING, C. D., DYSON, G., FLACKS, C., STAUSKAS, P. — Static Power Supplies: To develop static inverters which operate from DC power sources and deliver regulated AC power, ranging from a few VA up to approximately 2.5 KVA	326
RICHARDSON, R. J., SMALL, J., BARKER, N. S., ZUTRAUEN, S., MITCH- ELL, R. J., MARSHALL, R., TAMAGI, T., HEYBROEK, C., SMITH, L. C., LAWRENCE, P., HEINMILLER, B., MOISEEV, S. — Tem- perature Control Systems: These systems which include solid	

¹ On behalf of the Atomic Energy of Canada Ltd.

ENGINEERING

state electronic controllers, temperature selectors, duct sensors, and anticipators are employed for various aircraft compartment control as well as anti-ice control. Included in this work are systems for the control of engine-bleed air and/or ram air as well as electrical heating of aircraft windshields for bird-proofing and anti-icing 327

Johnson, Mathey, & Mallory Ltd.

BOURGAULT, P. L., FRASER, G. H., BURGER, D. W. R. — Research on electrolytic integration 328

BOURGAULT, P. L., RANFORD, R. E., BATELAAN, J., BRUVELAITIS, S., FRASER, G. H. — Research on the tantalum/tantalum oxide system for high frequency electrolytic capacitors 329

Litton Systems (Canada) Ltd.

MITCHELL, T. G., ROTHFUSS, H., ENGLER, F., PANESAR, D. — Inertial navigation systems 330

Marsland Engineering Ltd.

ARMSTRONG, A. S., DIETZ, R., PRICE, B. — Visual range computers 331

FAIREY, B., CONNER, J. — Sound propagation over 360° in open space for auditoriums, swimming pools, shopping plazas, and exhibitions, i.e. Special Speaker System 332

JONES, J. N., MORITZ, F., PRICE, B., FAIREY, B. — Special field telephone sets, self-powered 333

LEESON, F. D., ROWE, R., GRUNWELL, M. — Sonar simulators for training aids¹ 334

MARSLAND, L. H., ARMSTRONG, A. S., PRICE, B. — Small analogue plotting systems 335

WALKER, R. W., CONNER, J. — Solid state stereo and public address amplifiers (15 watts to 100 watts) 336

Northern Radio Manufacturing Co. Ltd.

DESBRISAY, A. W. Y., KRUPPA, J. H. — Development of variable speed data code regenerators 337

¹ Military requirement.

ENGINEERING

WHITE, P. W., SHOWALTER, L. C. — Development of scanning tele-	338
metering systems	
Development of miniaturized multichannel data transmission ter-	339
minal equipment	

Union Carbide Canada Ltd.

BATA, G. L., HAZELL, J. E., PRINSEN, J. H. — Separation of α -olefins	340
BATA, G. L., LARSEN, H. R., HOLLINGSWORTH, J. B. L. — Plastic insu-	341
lations in power transmission systems	
BATA, G. L., VADORI, M. R. — Lubrication and heat transfer studies	342
using synthetic polyethers	

Varian Associates of Canada Ltd.

MACDONALD, K. A. — Development of long life, high current, density	343
thermionic emitters	
MACDONALD, K. A., BEECKER, K., VIANT, M. — Research on improve-	344
ments to small microwave tubes	
SMITH, G. C., BEECKER, K., SANDERSON, H. T. — Development of	345
travelling wave tubes	
SMITH, E. R., SANDERSON, H. T. — Development of reflex klystrons in	346
following frequency bands — X, Ke, Ku, K, and Ka	
VIANT, M. — Development of millimeter reflex klystrons and extended	
interaction oscillators	347

FORESTRY

V

**Department of Lands and Forests
Forestry Branch**

BECKWITH, A. F. — Problems in measurement, recording, and processing of data concerning the growth and yield of forest stands and individual trees. Estimating the availability of timber resources and products. Design and analysis of investigations to evaluate the productivity of artificial and natural stands	348
CARMICHAEL, A. J. — Study of the relation of anatomical and chemical wood properties to wood (product) qualities	349
FOWLER, D. P., HEIMBURGER, C., RAUTER, M. — Tree-breeding work, attempting to develop white pine which is resistant to blister-rust; hybrid aspen-type poplars of good growth form and disease resistance; quality spruce for lowland sites in Northern Ontario	350
GORDON, A. G. — Growth and nutrition of spruce on a complete range of forestry sites. Dry weight productivity and nutrient cycling in spruce forests. Ecology of spruce and spruce forests. Studies of species and racial variation of the spruce genus in relation to growth and relative efficiency in nutrient uptake	351
HADDOW, W. R. — Study of the progress and effects of white pine blister rust in Ontario	352
HILLS, G. A., BOISSEAU, A. N., BURGER, D., PIERPOINT, G., WILLIAMS, J. R. — Assessment of potential of forest land of Ontario for the production of timber and other crops pursued simultaneously at the regional level of study and at the factorial level with site regions	353
HOLOWACZ, J. — Advising on the economic aspects in the planning of forest research projects. Participating in forest research projects reviving economic analysis. Investigating the occasional market opportunities for forest products. Relationship between forest resources of Canada and those of Eastern Europe	354

FORESTRY

LARSSON, H. C. — Establishment of selected high quality silver maple and eastern cottonwood in swamps devastated by the Dutch elm disease. Establishment of high quality hard maple, poplar, red oak and black cherry in low quality mismanaged stands on the uplands selection of high yielding trees of five maple species for the production of maple sap and syrup. Use of silvicides, herbicides, and soil sterilants for stand conversion, weed and shrub control thinning, and de-barking. Detailed growth studies on hard maple, silver maple, black cherry, American basswood, white ash, and eastern cottonwood	355
LEECH, R. H. — Studies of the nutritional needs of conifers, particularly red pine, made through application of mineral fertilizers. The purpose is to develop techniques for determining season of uptake of nutrients and to measure the growth effects of nutrients by plot designs, mensurational devices, foliar and soil analyses. Also to determine economic return from fertilizers	356
LYON, N. F., McEWEN, J. K., KOKOCINSKI, G. — Study of silvicultural characteristics of tree species of Northern Ontario. Study of the effects of excessive moisture conditions on tree growth in the Cochrane Clay Belt	357
MCLEAN, N. N., ANDERSON, H. — Study of growth and quality of sugar maple in central Ontario and study of regeneration problems	358
MULLIN, R. E., GLERUM, C. — Research in all aspects of regeneration (artificial) for the technical and scientific improvement of the reforestation program	359
RAYMOND, F. H. — Studies in forest mathematics — mainly concerned with adaptation of existing statistical and mathematical theory to the practical needs of forestry investigations and operations	360
SINCLAIR, G. A., STROEMPT, G. — Study of silvics of southern Ontario tree species and the effects of prescribed burning and its role in forest management	361

LIFE SCIENCES

VI

**Department of Lands and Forests
Fisheries Research Branch**

BERST, A. — To determine the effects of disease on the survival of planted trout	362
BERST, A., TAIT, J. S., DEWAR, J. E. — To develop through artificial selection, a stable, reproductive hybrid between lake trout and brook trout, which will be capable of living in the Great Lakes habitat formerly occupied by the lake trout	363
To describe the life history and ecology of splake (hybrid between brook trout and lake trout) introduced into natural waters	364
To explore the potential of selective breeding of fish as a technique in modern fish management in changing environments	365
CHRISTIE, W. J. — To determine and describe the factors causing the violent fluctuations in abundance of whitefish in the Bay of Quinte and Lake Ontario. This is an outgrowth of a study which demonstrated that the traditional whitefish fry plantings did not contribute significant numbers of fish to the fishery	366
To assess the possibility of re-establishing a commercially useful population of lake trout in eastern Lake Ontario while the sea lamprey population continues to exist in the area	367
To trace the arrival and build-up in Lake Ontario of white perch, a new species in this lake, and to assess its impact on the other resident species. The study is also designed to obtain the kind of information necessary to management in the event that a commercial or sport fishing for the species develops	368
CHRISTIE, W. J., COBLE, D. — To determine the life history and movements of the American eel in Lake Ontario and tributary waters, to assess the potential of the population for increased exploitation by commercial fishermen and to assess the effect, if any, of the installation of the St. Lawrence Seaway on the size of the population	369

LIFE SCIENCES

CHRISTIE, W. J., COBLE, D. — To assess the extent of exploitation by anglers and by commercial fishermen on the walleye population of the Bay of Quinte during times of both scarcity and abundance, and to determine whether the two kinds of fishermen actually compete for fish	370
To explore, using trawls, the open part of Lake Ontario for stocks of fish of commercial value	371
CHRISTIE, W. J., LOFTUS, K. H. — To attempt the introduction of Kokanee, a land-locked variety of sockeye salmon, to Lake Ontario in an effort to complement existing fish stocks with this new species. Populations to be used for commercial and sport use	372
COBLE, D. — To study the growth of a number of species (suckers, yellow perch, etc.) using special injections which are deposited in the bones and scales of the fish to form time marks	373
COBLE, D., MAHER, F., FRY, F. — To document the contribution of successive year classes of small mouth bass to the sport fishery of South Bay. These data test the reliability of predictions of the quality of bass angling based on temperature index known to influence class year strength of bass in their first year of life	374
To document through experimental fishing and sampling the long term changes in fish populations vulnerable to pound nets in South Bay, Lake Huron. Such changes have been found to be roughly representative of the situation throughout Lake Huron as a whole	375
CUCIN, D., MAHER, F., FRY, F., COLLINS, J., SMITH, J., REGIER, H. — To discuss and describe the factors influencing the strength of whitefish year classes throughout Lake Huron. Fluctuations of abundance, related to variable year class strength is a major problem. Whitefish stocks, now known to be discrete, are being sampled in areas such as North Channel, Georgian Bay, South Lake Huron, South Bay, as a means of establishing the relative strength of year classes in the fisheries. These are then related to the limnological and meteorological conditions prevailing during their early life in search of relationships	376
DECHTIARENKO, A. — To document the build-up, in the smelt of Lake Erie, of the sporozoan parasite, <i>Glugea hertwigi</i>	377

LIFE SCIENCES

To survey the parasites occurring in the important fish of Lake Ontario and to discover which of those may be important influences on abundance of fish	378
FABER, D. — To discover and study the factors influencing class year strength (survival of whitefish during their first year of life) in South Bay. Directed at young fish — locations at various times of year, and methods of trapping to study	379
FERGUSON, R. G. — To study spawning smelt throughout Lake Erie to determine whether there are discrete spawning populations which may require special management	380
To describe the horizontal and vertical distribution of smelt in Lake Erie and to determine the environmental factors which influence that distribution. This will allow prediction of the location of smelt concentration and help in the development of new fishing gear; and will contribute towards an ability to predict long range trends in the fishery	381
To study the factors related to the alternate strong and weak year classes of smelt in Lake Erie	382
To monitor, by sampling, the catches made by Lake Erie commercial fishermen in order to assess the status of the various fish populations and the impact of the fishery on these populations	383
To develop, if possible, index fishing stations at which samples of the young-of-the-year fish representative of the entire Lake Erie population situation can be taken. If successful this will allow longer range predictions of expected conditions	384
FRASER, J. M. — To measure and describe the scope of normal, year to year changes in natural brook trout populations	385
To increase the numbers of brook trout available to anglers by manipulating the harvest	386
To investigate the possibilities of providing spawning facilities (artificial if necessary) for brook trout to improve success of natural reproduction	387
To determine the potential use of fish toxicants in the management of lakes for brook trout	388
To investigate the role of white suckers in limiting the survival of planted brook trout in lakes	389

LIFE SCIENCES

FRASER, J. M. — To investigate the variety of lake environments inhabited by brook trout with a view to developing a useful classification of such lakes	390
To develop a practical stocking rate formula for types of brook trout lakes in order to use hatchery stocks more efficiently	391
FRASER, J. M., MARTIN, N. V., MACLEOD, J. C. — Algonquin Park Creek Census: The measurement of the harvest of important game species by anglers in a number of waters annually. This provides a measure of the natural variation in the population between years and eventually a known background on which to assess the effects of management technique	392
MACLEOD, J. C. — To evaluate the success of planting smallmouth bass fingerlings in lakes already supporting a bass population	393
To measure the sub-lethal effects of detergents on smallmouth basses; e.g. do they affect reproduction, feeding, respiration, activity?	394
To study the factors involved in the production of eggs, fry, and fingerling smallmouth bass, with a view to determining how summer temperatures influence year class size in Lake Opeongo	395
To determine the factors influencing the growth of smallmouth bass during their first year of life and to determine their effect on the ability of the bass to survive their first winter	396
MAHER, F. P., LOFTUS, K. H. — An experiment is underway to attempt the establishment in Lake Huron, of Kokanee, a land-locked variety of sockeye salmon, as a new species for commercial and sports fisheries. The first of a series of four annual plantings has been made in selected stream and shoal areas. Studies to determine survival and growth are current	397
MAHER, F. P., SMITH, J., FRY, F. — To describe the survival growth and life history of splake (hybrid between lake trout and brook trout) planted in various parts of Lake Huron. Their contributions to the fishery and their vulnerability to sea lamprey predation	398
MARTIN, N. V. — To compare plankton feeding with fish feeding lake trout in terms of growth rate, age at maturity, population stability, egg production, quality of fish produced, and management techniques necessary	399

To discover the reasons for the poor survival of hatchery reared young lake trout when planted in lakes, e.g. Opeongo of the Laurentian Shield. The role of soft water vs. hard water is now being investigated	400
MARTIN, N. V., JERMOLAJEV, E. — To study the very early life history and ecology of lake trout to discover whether this stage is important in determining the numbers of lake trout in a population from year to year	401
McCOMBIE, A. M. — To study the plant plankton of the Bay of Quinte, Lake Ontario, and make qualitative and quantitative comparisons with 1945 data with a view to determining the effects of and rate of eutrophication (aging and enrichment)	402
To study specific physical (temperatures, seiches, currents) and chemical (oxygen, hardness, pH, etc.) conditions of water in relation to areas and times specified as important to particular fisheries problems	403
McCOMBIE, A. M., LOFTUS, K. H. — To provide liaison in fisheries interest with the Great Lakes Institute, University of Toronto, in respect to the support provided for that agency in its limnological research on the Great Lakes	404
RECKAHLN, J. — To measure the survival and growth of Kokanee in Lake Huron and to describe their feeding habits	405
RYDER, R. A., MARTIN, N. V., DEWAR, J. E. — To study the suitability of the Arctic Grayling as a sports fish in Ontario	406
RYDER, R. A. — To discover and describe a practical index or indices that will be useful in predicting the fish production potential of lakes	407
To study the horizontal and vertical variations of total dissolved solids and total alkalinity during the open water period in an oligotrophic (young) lake. In using total dissolved solids or total alkalinity for estimating the productivity of a lake the seasonal fluctuations of these parameters must be understood if sampling requirements across the province are to be reduced to a practical level	408

LIFE SCIENCES

RYDER, R. A. — To describe the ecology of walleyes in a lake typical for walleyes in Ontario to provide an improved basis for management of the species	409
To prepare an annotated bibliography on walleyes and on closely related North American species	410

Department of Lands and Forests

Wildlife Research Branch

FYVIE, A., JOHNSTON, D. — Diseases and parasites of wildlife — their effects on wildlife population and their influence on livestock and humans	411
HEPBURN, R. L., SIMKIN, D. — Big game: Populations, distributions, ecology, and reproduction of deer, moose, and caribou. Effects of weather, hunting, predation, range quality	412
KOLENOSKI, C., ADORJAN, A., SHANNON, J. — Predators: Populations, distribution, ecology, reproduction of wolves, coyotes, black and polar bears. Effects of wolves and coyotes on wildlife and wildstock development and application of predation control methods	413
LUMSDEN, H. G., SWANS, E. V. — Upland game and water fowl: Populations, distribution, of ruffed grouse and prairie grouse. Studies of reproduction of Canada geese	414
STEPHENSON, A. B. — Fur bearers: Population, distribution, ecology, and reproduction of beaver and otter. Effects of trapping, predation, range quality: analysis of harvest statistics for most fur bearers	415

Ontario Research Foundation

Department of Applied Microbiology

CAMPBELL, L. A. — Non-biological purification of wastewater	416
EFFER, W. R. — Upgrading of cheese whey	417
LADELL, J. L. — A study of the morphology of plants, particularly trees	418
SIERRA, G. — Biochemistry of bacterial germination	419
SMITH, D. K. — Synergism in toxic action with ozone and chlorine	420

Ontario Water Resources Commission
Laboratories Division

NEIL, J. H., CLARK, J. A. — A microbiological study of coliforms, streptococci, pseudomonads, and anaerobic bacteria, along with their respective fecal types to provide a spectrum of water pollution indicator organisms	421
NEIL, J. H., McMANUS, ELIZABETH — Investigations on the distribution and nutrition of bacteria from lake sediments	422
NEIL, J. H., SCHENK, C., WILE, MRS. I. — Laboratory and field evaluations of the safety and effectiveness of aquatic herbicides, insecticides, and algicides	423
NEIL, J. H., SCHENK, C. — Laboratory and field evaluations of the effect of municipal and industrial waste discharges on aquatic life	424
NEIL, J. H., McMANUS, ELIZABETH — Heterotrophic bacteria from lake waters — their enumeration and identification	425
NEIL, J. H., SCHENK, C., MICHALSKI, M. — A study of the phytoplankton populations of the littoral waters of Lakes Ontario and Erie	426

Warner-Lambert Research Institute

LUMB, G. D. — Studies on the development of collateral circulation in the heart and drugs that modify it	427
LUMB, G. D., DE LA IGLESIA, F. A., SOSA-LUCERO, J. C. — Research into improved toxicology methodology for safety and efficacy of new drugs	428
Influence of nutritional background in the response of animals to drug administration	429
LUMB, G. D., DE LA IGLESIA, F. A. — Development of automatization in processing data from toxicology experiments (biological, chemical, haematological, and pathology analyses)	430
LUMB, G. D., DE LA IGLESIA, F. A., SOSA-LUCERO, J. C. — Structural, ultrastructural biochemical and metabolic studies on the in vivo and in vitro alterations induced in the liver by the administration of drugs	431

LIFE SCIENCES

Canada Packers Limited

WITTY, R., LIKUSKI, H. — Protein-energy relationships in animal feeds	0432
Evaluation of protein raw materials used in animal feeds	0433
WEBB, G. G. — Factors affecting the shelf life of vacuum-packaged cooked meats	0434
DONOVAN, R. G., WOLF, S. F. — The use of enzymes for the unhairing of hides and skins to be used in the manufacture of leather	0435

PHYSICS

VII

**Ontario Research Foundation
Department of Physics**

- PULLAN, H., NORGATE, G., HEYLAND, G. R. — Doping of semiconductors by using energetic ion beams 432

Abitibi Paper Co. Ltd.

- HUSSAIN, S. M. — Development of an ultra-high shear viscometer for paper coating 433

- YAN, M. M., LARSEN, M. L. — Flame retardant fibreboards 434

Aluminum Laboratories Ltd.

- HAY, R. H. — Study of hydrogen in aluminum 435

Canadian Westinghouse Company Ltd.

- LAKE, R. E. W., SAUNDERS, R. — Electroluminescence: Development of electroluminescent phosphors and of photoconductor materials 436

- Electroluminescence: Development of electroluminescent display panels with and without memory stage 437

- Development of multicolor programmed displays 438

- PIECZONKA, W. A., CLAYTON, N. S. — Semiconductors: Research on surface effects, metal oxide silicon studies, insulated-gate-field-effect transistors 439

- PIECZONKA, W. A., BARBER, H. D. — Semiconductors: PN junctions, studies in bulk phenomena of silicon, device reliability 440

**Cominco
Sheridan Park**

- LEYLAND, B. K., LAURIENTE, D. H. — Lead for noise control in buildings 441

PHYSICS

Duplate Canada Ltd.

BATESON, S., FICKERT, K. W. J., URBAN, P. — Ferroelectric ceramic materials based on lead metaniobate	442
BATESON, S., HUNT, J. W., SINHA, N. K., GOLDING, W. — Study of thermal tempering of flat glass	443
BATESON, S., KAPPES, K., LOMELAND, E. — Alumina ceramic materials	444

Edo (Canada) Ltd.

ADHAV, R. S. — Piezoelectric single crystals and their application to linear electro-optic modulation in display systems	445
--	-----

Ferranti-Packard Electric Ltd.

ATHERTON, D. L. — Practical applications of superconductivity particular to DC generators and magnets for research, particle accelerators and M.H.D. generators	446
---	-----

Litton Systems (Canada) Ltd.

FLANNAGAN, A., BRYAN, K., GIBSON, R. — Research in gas bearing technology	447
STEIN, A., MAU, A., TREIGYS, J., PFEIFFER, N., YOUNG, W. — Research in pattern recognition systems	448

Northern Electric Co. Ltd.

COLTON, D. R. — Thermodynamics of semiconductor dopant systems	449
EASTWOOD, H. K., BOYES, M. H., SZAPLONCZAY, A. M. — Investigation of single crystal and thin film ferrites	450
FERGUSSON, R. R., KNEE, N. D. — Studies of the mechanisms involved in epitaxial silicon deposition	451
KRIEGLER, R. J., FERGUSSON, R. R., BARTNIKAS, R., BASINSKI, J. — Dielectric films of silicon dioxide and other inorganic dielectrics	452
MCDONALD, R. D., SZAPLONCZAY, A. M. — Coprecipitation studies of manganese-zinc ferrite	453
PARKER, T. J. — Diffusion of impurities in silicon	454

Members of the Ontario Economic Council are:

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118

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RESEARCH INDEX ONTARIO • 1968



**AGRICULTURE
ARCHITECTURE
EARTH SCIENCES
CHEMISTRY
ENGINEERING
FORESTRY
LIFE SCIENCES
PHYSICS**

**and a Summary
of Reported Industrial
Research Facilities**

Published by
The Ontario Economic Council
950 Yonge Street
Toronto, Ontario

Government
Publications

1968 RESEARCH INDEX

**Projects being carried on
within Ontario Government
Department and Agencies,
and in a number of
Companies operating in
Ontario in**

**AGRICULTURE
ARCHITECTURE
CHEMISTRY
EARTH SCIENCES
ENGINEERING
FORESTRY
LIFE SCIENCES
PHYSICS**

**and
a Summary of Reported Industrial
Research Facilities**

Published by the Ontario Economic Council

FOREWORD

This fourth edition of the Research Index is a continuation of the efforts of the Ontario Economic Council to catalogue annually significant research projects in the natural sciences, engineering and architecture, being undertaken by Ontario government departments and agencies and by industries in this province.

To the 1968 edition has been added a new section. In it a start has been made to set out the research capabilities of private companies operating in Ontario. Some 77 of the latter are listed.

By initiating this publication, the Ontario Economic Council has sought to broaden the knowledge of, and to expand the private and public investment in research in those areas which contribute to a higher rate of economic growth. Indeed it was felt that failure to encourage such support was to jeopardize the future well-being of the people of this province and of this nation.

In no way should this be interpreted to denigrate the vital role of pure research. It simply recognizes that application to often very localized problems and potentials is vital if we are to ensure for the citizenry a rising standard of living.

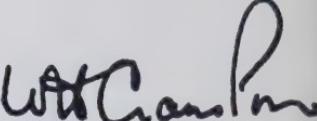
We have to capitalize, with all the resource technology available, on current assets. Indeed applied research is perhaps the most significant production tool in the hands of modern management.

* * * *

We would particularly like to thank those companies and the departments and agencies of the Ontario government whose contributions make this Index possible. We would also commend the editor, Dr. A. D. Misener, for his continuing interest and capable administration.

While there has been a steadily growing demand for copies of this Index, both within Canada and abroad, the Council's concern was to initiate rather

than perpetually to sponsor. Enclosed with this edition is a return address postcard through which it would be appreciated if you would indicate whether you find the publication of sufficient interest to warrant its continuance and what revisions or restructuring should be incorporated in future editions if such are indicated.



W.H. Crosson

Chairman
Ontario Economic Council.

NOVEMBER, 1968

CONTENTS

	PAGE
Foreword	3
Index of Contributors	7
Index of Investigators	10
Subject Index	30
Directory of Projects	59
AGRICULTURE	
Projects 1001–1090	59
ARCHITECTURE	
Projects 2001–2016	69
CHEMISTRY	
Projects 3001–3122	73
EARTH SCIENCES	
Projects 4001–4024	87
ENGINEERING	
Projects 5001–5220	95
FORESTRY	
Projects 6001–6037	115
LIFE SCIENCES	
Projects 7001–7111	121
PHYSICS	
Projects 8001–8055	135
Addresses of Participating Companies	
Including a Summary of Reported Industrial	
Research Facilities	143

INDEX OF CONTRIBUTORS **GOVERNMENT DEPARTMENTS AND AGENCIES**

Department of Agriculture and Food

- Extension Branch 2001
Farm Economics, Cooperatives and Statistics Branch 1001–1020
Horticultural Research Institute of Ontario 1021–1034, 2002
Kemptville College of Agricultural Technology 1035–1051
Milk Commission 1052
New Liskeard College of Agricultural Technology 1053–1066
Ridgetown College of Agricultural Technology 1067–1082,
7001–7010

Department of The Attorney General

- Office of the Fire Marshal 5001

Department of Education

- School Planning and Building Research Section 2003–2016

Department of Highways

- Materials and Testing Division 5002–5016
Planning Branch 5017, 5018
Research Branch 5019–5036

Department of Lands and Forests

- Research Branch, Fisheries Section 7011–7061
Research Branch, Forestry Section 4001, 4002, 6001–6034
Research Branch, Wildlife Section 7062–7066

Department of Mines

- Geological Branch 4003–4008, 5037
Laboratory Branch 3001–3005, 4009–4011
Mines Inspection Branch 5038
Office of the Comptroller 5037
Office of the Mine Assessor 5037
Office of the Sulphur Fumes Arbitrator 5039

Hydro-Electric Power Commission of Ontario

Research Division 3006-3009, 5040-5064, 7067-7069

Ontario Research Foundation

Department of Applied Microbiology 5065, 7070, 7071
Department of Engineering and Metallurgy 5066-5076
Department of Materials Chemistry 3010-3016
Department of Organic Chemistry 3017-3027, 6035-6037
Department of Physical Chemistry 3028-3034, 5077
Department of Physics 8001-8005
Department of Physiography 1083, 4012
Department of Textiles 3035, 3036

Ontario Water Resources Commission

Laboratories Division 3037, 7072-7079
Research Division 5078-5092, 7080, 7081
Water Resources Division 4013-4019

Toronto Harbour Commission

Engineering Division 5093

ONTARIO-BASED INDUSTRIAL COMPANIES

Abitibi Paper Company Limited 3038, 3039, 5094, 5095, 8006, 8007
Abrex Specialty Coatings Limited 3040, 3041
Aerofall Mills Limited 3042, 5096
Aluminium Laboratories Limited 5097-5102, 8008
Atlas Steels Company 5103-5109
Atomic Energy of Canada Limited 1084-1086, 3043-3045, 5110-5112
7082-7085
Barringer Research Limited 4020, 7086, 8009-8015
British American Research and Development Company 3046-3051
Canada Packers Limited 3052-3059, 7087-7092
Canadian Gas Association 5113, 5114
Canadian General Electric Company Limited 5115-5124, 8016
Canadian Structural Clay Association 5125
Canadian Westinghouse Company Limited 5126-5131, 8017-8023
Champlain Power Products 5132, 5133

Chemical Projects Limited 3060-3062, 4021
Cominco Limited, Product Research Centre, Sheridan Park, Ontario
3063-3066, 5134-5141, 8024
Computing Devices of Canada Limited 5142-5147, 8025-8028
Desitron Company Limited 5148
Dilworth, Secord, Meagher, and Associates Limited 5149-5156, 8029
Dunlop Research Centre 3067-3070, 8030-8032
Duplate Canada Limited 8033-8035
Edo (Canada) Limited 8036
Eldorado Nuclear Limited 5157-5160
Electric Reduction Company of Canada, Limited 3071-3074
Escott Building Corporation Limited 5161
Ferranti Packard Electric Limited 5162-5172, 8037
Fiberglas Canada Limited 3075-3079
Garrett Manufacturing Limited 5173-5176
Geophysical Engineering and Surveys Limited 5177, 5178
Huntec Limited 4022-4024, 8038
International Cellulose Research Limited 3080-3085, 7093, 8039-8041
Johnson Matthey and Mallory Limited 5179-5181
Lever Brother Limited 3086
Litton Systems (Canada) Limited (Litton Industries) 5182, 8042-8044
Mallory Battery Company of Canada Limited 3087
M & T Products of Canada Limited 3088, 5183
Maple Leaf Mills Limited 1087-1090, 3089-3093, 7094-7097
Marsland Engineering Limited 5184-5193
Northern Electric Company Limited 3094, 5194-5196, 8045-8053
Northern Radio Manufacturing Company 5197-5199
Procter and Gamble Company of Canada Limited 3095, 3096
Reichhold Chemicals (Canada) Limited 3097-3101
Rio Algom Mines Limited 3102-3109
St. Lawrence Starch Company Limited 7098
Sinclair Radio Laboratories Limited 5200-5208
Spar Aerospace Products Limited 5209-5212, 8054, 8055
Sprague Electric of Canada Limited 3110, 5213
Thompson Research Associates Limited 3111, 3112, 7099
Union Carbide Canada Limited 3113-3122, 5214, 5215
Varian Associates of Canada Limited 5216-5219
Warner-Lambert Research Institute of Canada Limited 5220, 7100-7111

INDEX OF INVESTIGATORS

The purpose of this Index is to provide names of people who may be contacted for the purpose of obtaining further information regarding the projects here listed. Different agencies have different practices in this regard, some prefer you to contact the person most familiar with the work, others prefer that the director of the project or the director of the research division be the initial contact.

In the Directory of Projects, the first name in each project listed is the one the responders have indicated should be your initial contact.

This index lists all the individuals associated with the research. It is our method of giving due credit to those scientists and engineers who are properly proud of their achievements described in this volume.

Abraham, F. R.	1006, 1015
Abrahamsohn, G.	5173
Abul-Khair, A. M.	2009
Acton, K.	5074
Adair, T. H.	5066-5068
Adamek, S.	3067, 3070
Adami, A.	3012
Adams, A. M.	1021
Addie, L. A.	5181
Addison, R.	7063
Addison, W. D.	7011, 7060
Adhav, R. S.	8036
Adolph, G.	8002
Adorjan, A.	7064
Alexander, J. C.	5147
Algotsen, Miriam	1022
Al-Hashimi, M.	1001, 1003
Allen, C. J.	5069
Andersen, A. F.	2003, 2004, 2008-2012
Andersen, E. T.	1023-1026
Andersen, H.	5113
Anderson, H. W.	6001-6003
Andrejchyshyn, W. M.	3120
Andrews, R. H. G.	5078, 5079
Appleton, J. W.	3052
Argue, A.	5017, 5018
Armstrong, A.S.	5184, 5185, 5190

Armstrong, M. D.	5019
Atherton, D. L.	8037
Atkinson, B. W.	5173
Atkinson, E. A.	5121
Badhwar, L. K.	8025
Bain, J.	1052
Baldwin, C. S.	1067, 1070, 1077
Baldwin, S. H.	3039
Ballantyne, S.	5158
Barber, H. D.	8020
Barfoot, L.	1017, 1018, 1052
Barnes, E.	3102–3104
Barouch, M.	4013
Barr, G. R.	1035, 1036, 1047–1051
Barrett, C. M.	5038
Barringer, A. R.	5177
Bartlett, M. W.	8051
Barton, H.J.	3040
Basinski, J.	8050
Bata, G. L.	3113–3122, 5214, 5215
Batelaan, J.	5181
Bateson, S.	8033–8035
Bays, N.	3047
Beach, M. E.	1037
Beal, S.	3028
Beattie, D.	1082, 7001, 7002
Beck, J. R.	5142
Beckwith, A. F.	6004–6006
Beeker, K. D.	5217
Belak, M. J.	5162
Belch, A.	7100
Belcher, R.	5202
Bell, R. P.	5132, 5149–5151
Bencosme, S.	7111
Berg, W.	7078
Beri, R. M.	6036
Bernard, M.	5175
Berst, A. H.	7012–7016
Bertram, R. W.	8003

Billington, I. J.	5132, 5151, 5152
Bisset, H. A.	5173
Black, S. A.	5080–5084, 5087
Blum, H.	1002, 1003
Bohdanowicz, A. B.	5163
Boissonneau, A. N.	4001
Bolwyn, B.	1068
Booker, P. P.	5135, 5136
Boulton, J. T.	3105
Bourgault, P. L.	5179–5181
Bowness, E. R.	7094
Bozoki, B.	5061
Boyd, S.	3068
Boyes, M. H.	8051
Bradstreet, B. J.	5115, 5116
Bradt, O. A.	1023–1025, 1030
Bratina, W. J.	5066
Bremner, G. F.	5153, 5154, 8029
Briggs, H. A.	5119
Bristow, Q.	5112
Brogden, T. W. P.	8045
Brophy, (Miss) D.	3081
Brown, C.	5007, 5008
Brown, E. C.	3010
Brown, J. A.	5134
Brown, L. M.	5075
Brown, R. D.	5055
Brown, R. H.	1068, 1069, 1073
Brown, T. A.	5040
Brown, W. S.	5152, 5155
Bruce, I.	5146
Bruvelaitis, S.	5181
Bryan, D. M.	5001
Bryan, K.	8042
Buckles, F. G.	5200, 5201
Burger, D.	4001, 6007, 6008
Burger, D. W. R.	5179, 5180
Burger, F. J.	3110, 5213
Burke, T.	3053
Burnett, K. A.	1045

Burnett, T. C.	5124
Buth, D.	1011
Butler, R. E.	5122
Caley, R. H.	3013, 3014
Cama, V.	3097
Cameron, A. W. W.	5041–5047
Campbell, B.	1012-1014
Campbell, D. W.	7087
Campbell, F.	4009, 4010
Campbell, H. J.	3035
Campbell, L. A.	5065
Campbell, S.	1008, 1009
Carmichael, A. J.	6009
Carrothers, D. F.	3095
Carson, R. O.	5103
Casey, J.	5002
Cashmore, K.	3046, 3047
Castrucci, P.	5206
Caughey, D. M.	8046, 8052
Cavanagh, R. L.	5037, 5069–5073
Chalmers, D. F.	3096
Chan, C.	3060–3062, 4021
Chan, R. K.	3076
Chang, M. Y.	3080
Chapman, H.	5116
Chapman, L. J.	1083, 4012
Chatfield, E. J.	8001, 8004
Chaundy, C. J. F.	5110
Chiu, M.	5015
Chojnacki, B.	5003, 5004, 5012, 5013, 5031
Chong, G.	5020
Choo-Ying, A.	4017
Chow, S. M.	5117
Christensen, A.	5143
Christie, A. E.	7080
Christie, W. J.	7017–7022
Christison, J.	7070
Churchill, T. R.	5112, 7084
Clark, F. A.	5127

Clark, J. A.	7072
Clark, J. H.	1038, 1039
Clarke, A. R.	3122
Clarke, R. L.	7082
Clayton, N. S.	8021
Clayton, R. E.	2001
Cline, R. A.	1023, 1024, 1026
Coladipietro, R.	8029
Collin, G. H.	1023–1026, 1031
Collins, J.	7023, 7044
Colton, D. R.	8047
Conner, J.	5187, 5193
Conroy, N.	7076
Cook, Frances I.	1027
Corkill, J. T.	5005-5008, 5011
Cornell, (Miss) B.	1018
Courtemanche, R.	3045
Cowper, D. R.	7083
Cox, W.	4020
Craig, J. A.	5194, 5196
Craigen, W. J. S.	5157
Crombie, G.	4001
Crossland, K.	5104
Crowther, R. F.	1028
Cruickshank, N. H.	3111, 3112, 7099
Csagoly, P.	5036
Cucin, D.	7037
Curtis, J. D.	1040, 1041, 1043
Dalal, K.	5128
Das, B. S.	3017
DasGupta, S.	3043, 3044
Davidson, I. A.	5195
Davies, A. G.	3043, 3044, 7083
Davies, J.	8012
Davis, H. J.	5164
Dawson, F.	4003
Dawson, J. E.	5142
Dean, F. H.	3018
de Buda, R.	5117

Dechtiarenko, A.	7024, 7025
de la Iglesia, F. A.	5220, 7100-7111
DeLorenzi, C.	5200
DeMarchi, R.	5183
DesBrisay, A. W. Y.	5197, 5198
de Valence	5027
Devine, R. E.	5126
Devzman, H.	3077
Dewar, J. E.	7013
Dick, R.	8054, 8055
Dietz, R.	5185
Dillon, W. J.	1006, 1007, 1015
Dingle, A. D.	8030-8032
Diosady, P.	7078
Dirksen, A.	7026, 7031
Dixon, J. E.	3095
Dixon, P. R.	5128
Donhoffer, D. K.	5112
Donovan, R. G.	7087
Downs, W. E.	3045
Dreisinger, B. R.	5039
Dudley, E. A.	8030-8032
Duncan, P. M.	3114-3116
Dure, J. D.	5144
Dutkewych, E.	3056
Dyck, P. J.	3089, 3090
Dyson, G.	5174
Easson, K. W.	5168
Eastwood, H. K.	8048
Ebinger, A.	3021
Edwards, A. T.	5051
Effer, W. R.	7067-7069
Elgar, E. C.	5118
Ellis, J. R.	5119
Emmens, D.	5146
Entwistle, S. D.	5194, 5196
Erven, C. C.	5041
Escott, G. K.	5125, 5161
Eslinger, M. J.	3054, 3059

Fairey, B.	5186—5188
Farrell, K.	5209, 5210
Feasby, D. G.	5158
Ferguson, R. G.	7027—7031
Ferguson, W. E.	1084—1086
Ferrie, J. S.	5048—5050
Fickert, K. W. J.	8033
Field, F.	5009—5011
Fielding, M. B.	5085—5087
Fisher, G. A.	1004—1007, 1011, 1015
Fisher, J. W.	3105—3109
Flannagan, A.	8042, 8043
Fleischer, F.	4013, 4018
Fleming, R. A.	1023, 1024, 1032
Forster, B.	5196
Forster, R. R.	1023, 1024, 1032
Fraser, D. C.	5177, 5178
Fraser, G. H.	5179—5181
Fraser, J. M.	7032—7039
Freure, R. J.	3048
Fricbergs, K.	5093
Fromm, H. J.	5021, 5022
Fuleki, T.	1029, 2002
Fung, J.	7091
Fylie, A.	7062
Galdi, G.	3060, 4021
Gammon, J.	5143
Gamula, P.	3091
Gardiner, J. S.	1042, 1046
Gardner, P. E.	3080, 3081
German, M.	7076
Giblon, R. E.	1008, 1009
Gilbert, L. H.	5113
Gill, P. S.	5173
Glerum, C.	6025
Goba, F. A.	5127
Godard, H. P.	5097
Golding, W.	8034
Golomb, A.	3022, 3032

Goode, J. R.	3102–3104
Goodfellow, H. D.	3042, 5096
Gordon, A. G.	6010, 6011
Gordon, R. A.	5124
Goulden, P. D.	3088, 5183
Goulding, H.	5153, 8029
Graham, G.	5202, 5203
Graham, N. A.	5128–5130
Graham, R. G.	5103
Grant, F. S.	4022
Graves, R.	5145
Gray, G.	5211, 5212
Griffin, J. D. A.	5056
Gruno, R. S.	5142
Grunwell, M.	5189
Gunning, J. R.	5094
Gupta, V. N.	3082, 3083
Guttman, H.	3063
Haddon, J. A.	4003
Hakka, L. E.	3121
Hamilton, R. E.	5123
Hampshire, F.	1043
Hantusch, G. H.	5195
Harbell, J.	5131
Hardy, J.	5176
Hare, G. E.	5111
Harmelink, M. D.	5023–5027
Harris, A. J.	5078–5092, 7080, 7081
Harrison, D.	5048–5050
Harrison, J.	7043
Hart, J. L.	5159
Hawkins, P.	3011
Hay, R. H.	8008
Hay, R. L.	5113, 5114
Hazelden, L.	3061
Hazell, J. E.	3113–3117, 5214
Henderson, D. J.	5133
Hepburn, R. L.	7063
Heyland, G.	8002

Hickling, C. D.	5174
Hicks, W. D.	3001, 4009, 4010
Hill, R. G. F.	1010–1016
Hills, G. A.	4001
Hirschfield, J. A.	5098, 5099
Hislop, T.	5071
Hogg, A. D.	5051
Hogue, R. H.	5133
Holder, D. A.	5095
Hollingberry, D.	5070
Holowacz, J.	6012–6015
Hopton, F. J.	3028, 5077
Hore, R. C.	4013, 4014
Howitt, F.	5100
Hudgins, J. F.	3096
Hudson, M. J. B.	5129
Hunt, J. W.	8034
Hurley, D.	7021, 7040, 7041
Hussain, S. M.	8006
Hutchins, R.	4023, 4024, 8038
Hutchinson, A.	1024, 1025, 1030
Irvine, I. J.	5143–5147
Irvine, O. R.	1044, 1045
Irwin, M.	5145
Iwanusiw, O. W.	5059
Jaciw, P.	6016–6020
Jackson, B.	4003
Jaeger, F.	5027
Jagger, C. E.	5120
Jankus, E. E.	3055
Jardine, R.	1052
Jean, B.	8025, 8028
Jermolajev, E.	7037, 7051
Joe, E. G.	5158
Johnston, A.	1052
Johnston, D. H.	7062
Johnston, R. W.	1067, 1070, 1077
Jones, D. E.	5052–5054

Jones, J. H.	5093
Jones, J. N.	5188
Jones, M. H.	3029
Joshi, V.	5148
Jung, F. W.	5035, 5036
 Kaepnner, W. M.	7093
Kambanis, S.	3098
Kappes, K.	8035
Katchky, M.	5120
Keil, C.	5165
Kelly, F. J.	3087
Kendrick, G.	4017
Kerr, E. A.	1030-1032
Kerr, H. S.	8055
Kershaw, P.	5173
Keshvani, K. J.	3102
Kettlewell, J.	8054
Keyser, G. M.	5055, 5056
Khouw, B. J.	7088
Kimball, W. J.	3116
King, D. E. C.	3037
Kinnibrugh, D. R.	5164
Kirby, E. M.	3019
Knee, K.	8049
Kocher, H.	5165
Koh, T. Y.	7089
Kolenosky, G. B.	7064
Koniuszy, (Mrs.) Z.	5014
Kortschinski, J.	5055, 5061
Kriegler, R. J.	8050
Kruppa, J.	5197-5199
Kucharska, H.	3099
Kuntze, R. A.	3010-3012
Kurtz, M.	5042-5044
Kwain, T.	7043, 7044
Kydd, J.	5182
 Laakso, R.	3001, 4009, 4010
Ladell, J. L.	6035

Lainevool, J.	5201, 5204
Lake, R. E. W.	8017-8019
Lane, E. D.	7022
Lang, G.	5210
Larsen, M. L.	8007
Larsson, H. C.	6016-6020
Last, A. J.	5071
Laughlin, R. G. W.	5077
Lauriente, D. H.	8024
Lautenschlaeger, F. K.	3069
Lawrie, G.	5176
Lee, D. C.	5063
Leech, R. H.	6021
Lees, D. H.	1084-1086
Leeson, F. D.	5189
Lemay, J. G. Y.	7093
Lemieux, Marilyn	2013
Lemon, H. W.	3020, 3022, 6036
Lewis, B. A.	3102-3104
Lewis, C. A.	7016, 7023, 7042-7044
Lewis, G. P.	5135, 5136
Leyland, B. K.	8024
Likuski, H. J.	7090, 7092
Linck, H.	5045-5047
Little, J.	5105
Loftus, K. H.	7045-7048, 7054
Lomas, H.	3021, 3022
Lomeland, E.	8035
Loughton, A.	1023, 1024, 1026, 1031
Love, J. A.	3084
Low, N. M. P.	8051
Luce, J. E.	8039-8041
Luckham, D. G.	2001, 7003-7008
Lumb, G. D.	5220, 7100-7111
Lumsden, H. G.	7065
Lynch, D.	5006-5008
Lyon, N. F.	6022, 6023
MacAuley, B.	5145
MacDonald, A. D.	1017, 1019

MacDonald, D. W.	1042, 1046
MacDonald, K. A.	5216
MacDowall, J.	4020, 7086, 8009—8015
MacKillop, D. A.	3067
MacKimmie, R. D.	5166
MacQueen, K. F.	1084—1086
Mag, T.	3058
Maine, F. W.	3075—3079
Mains, F.	3111
Manchester, D. F.	5095
Manchur, G.	5062, 5063
Marshall, R.	5175
Marsland, L. H.	5190
Martin, N. V.	7039, 7049—7051, 7061
Martin, R. J.	3012
Martin, W. A.	5057, 5058
Matolcsy, G.	3023
Mau, A.	8044
McAdie, H. G.	3030, 3031
McCabe, P.	3089—3091
McCombie, A. M.	7052—7054
McEwen, J. K.	6022, 6023
McGilvery, J. D.	3071—3074
McGirr, D. J.	3092, 3093
McGovern, P. C.	5039
McGrath, J. T.	5066, 5067
McKendry, J.	5211, 5212
McLaren, A. D.	1071, 1072, 1078, 1079
McLaughlin, R. H.	5120
McLean, M. M.	6024
McLeod, G.	3112
McLoughlin, G. T.	5146
McManus, Elizabeth	7073, 7074
McNeely, H. A.	4001
McNeill, J. D.	4020, 7086, 8009, 8012
McQuirk, D. J.	5167
McRae, G.	3060, 4021
Mellary, A. A.	4015
Melvanin, F. W.	5159
Mertens, W. G.	3058

Michalski, M.	7075
Millan, M.	4020
Miller, S. W. R.	3106
Mindreboe, K. J.	1069, 1073
Mir, M. K.	3099
Mitchell, L.	7108
Mitchell, R.	5175
Mitchell, T. G.	8043
Moddle, D. A.	3001, 4011
Moffat, A. J.	8010–8015
Moore, D.	5129
Moritz, F.	5188
Morphet, A. M.	1047–1051
Morris, J. D.	8053
Morrison, J.	5207, 5208
Morrison, W. D.	4018
Morrison, W. D.	1087–1090, 7094–7097
Moulding, D. G.	8027
Muehmer, J. K.	1031, 1074
Mulhall, V. R.	5121
Mullin, R. E.	6025
Murphy, J. R. B.	8026, 8027
Murthy, M. K.	3013–3016
Negm, H.	1047–1051
Neil, J. H.	3037, 7072–7079
Newbury, C.	8014, 8015
Niergarth, L.	5191
Nimmons, I.	7098
Niskanen, E.	5068, 5072
Nixon, M. L.	5149, 5152, 5154
Nordin, H. R.	3056, 3057
Norgate, G.	8005
Nowosad, R.	7079
Nunweiler, D.	5124
O'Connor, M. W.	3095
Oda, A.	5088–5092
Orlowski, S. T.	2005–2015
Ort, H. A.	5168

Osborne, A. D.	1039
O'Shaughnessy, T. A.	8022
Osmond, D.	7076
O'Toole, J. J.	1040, 1041
Owen, G.	7076
Pain, (Mrs.) Maria	2003, 2004, 2008
Parker, G. L.	3007, 3008, 7069
Parker, J.	8015
Parkinson, W. C.	1035, 1036
Parsons, D. V.	5137
Paul, M.	4020
Pears, B.	5173
Peng, J.	2014, 2015
Pennock, T.	8009, 8012
Peters, K.	3075
Phang, W.	5011, 5022, 5028
Pieczonka, W. A.	8020-8023
Piercy, R. C.	5136
Pierpoint, G.	4002, 6007, 6008
Pikula, R.	4016
Pittuck, A. D.	5157
Plaxton, Katharine	2016
Pogorski, L. A.	3060-3062, 4021
Poletneff, A.	5203
Poling, H. E.	5138-5140
Pollock, F. E.	3095, 3096
Porteous, C.	5127
Powell, C.	3042, 5096
Price, B.	5285, 5188, 5190
Price, M.	5131
Prince, C.	5173
Prince, L. A.	3117
Prinsen, J. H.	5214
Przybyla, F.	3087
Puddy, D. C.	5111
Pullan, H.	8002-8005
Pye, E. G.	4004-4008
Pytel, L.	5176

Quammen, W. A.	3096
Quon, H. H.	8048
Radford, P. J.	7099
Rahman, M. A.	5119
Rajan, J. B.	3066
Ralph, P.	4003
Ranford, R. E.	5181
Rao, R. P.	3076
Rauter, M.	6034
Rayfield, J. A.	5132, 5151, 5156
Raymond, F. L.	6026
Reckahn, J.	7042, 7044, 7055–7057
Reddering, H.	4023, 4024
Redelmeier, R.	1017–1019, 1052
Reid, S. G.	3024, 6036
Reimer, E.	3061, 3062, 4021
Reissmann, H. J.	1023
Remedios, E.	5076
Renes, A.	5213
Renzoni, C.	4014
Reynolds, L. M.	3025
Richardson, R. J.	5175
Ricketson, C. L.	1023–1026, 1030
Riedel, G.	7098
Riem, R. H.	3038
Robertson, J.	5174
Robeson, D.	4003
Robinson, C. R.	5147
Rollins, T. L.	8027, 8028
Rose, G. W.	5176
Ross, L.	3062
Rothfuss, H.	8043
Round, K. J.	5111
Rowe, R.	5189
Rummery, T. E.	3015, 3016
Ryder, R. A.	7011, 7058–7061
Ryell, J.	5012, 5013, 5016, 5031
Saba, M. C.	1015
St. George, B. C.	3049

Sanderson, H. T.	5218
Saunders, R.	8017-8019
Schenk, C.	7075-7079
Schonfeld, R.	5029, 5030
Schuld, F. W.	7009, 7010
Schwartz, N. V.	3069
Scrimgeour, J.	5122-5124
Searle, C. E.	5217
Secord, A. H.	5205
Sedmihradsky, P.	5130
Sefton, V. B.	3032-3034, 5077
Seth, B.	5106, 5107
Seto, P.	3033
Seymour, T. J.	5137
Shaw, E.	5145
Sherwood, K. J.	3077
Shimizu, H. H.	5137-5141
Shutt, T. C.	3078, 3079
Sibul, U.	4017-4019
Sierra, G.	7071
Simo, E.	5169
Simpson, C. E.	3037
Simpson, R. P.	3107, 3108
Sinclair, G. A.	6027-6029
Singh, B. A.	4015, 4019
Singh, K. P.	3118-3122, 5215
Sinha, N. K.	8034
Skeates, D. A.	6030, 6031
Skepasts, A. V.	1053-1066
Sloan, G.	5014
Smart, B. C.	5160
Smeltzer, J. E.	3048, 3050
Smith, C. N.	5170
Smith, E. R.	5218
Smith, G. C.	5217
Smith, J.	7016
Smith, M.	5126
Smith, P.	5019, 5031-5033
Sojak, M.	1075, 1076
Soltys, J.	3031

Sorflatén, A.	1020
Sosa-Lucero, J. C.	7100, 7101, 7103, 7105–7107, 7109–7111
Sowa, W.	3026
Spector, A.	4022
Spiro, J. G.	3051
Spooner, R. C.	5101
Stambolich, J.	5150
Standfield, R. O.	7066
Staples, M. L.	3035, 3036
Stauskas, P.	5174
Stein, H. A.	8044
Stephens, J. R.	1011
Stephenson, A. B.	7066
Stevens, A.	5178
Stevenson, C. K.	1067, 1070, 1077
Stewart, S.	7008
Stirling, R. J.	2016
Stonell, A. C.	8054
Stott, G. M.	5020, 5028
Stricker, S.	5064
Stroempl, G.	6032, 6033
Strom, R.	5050
Sugden, A.	6037
Suggitt, J. W.	3006–3009, 7067–7069
Sun, K. Y. L.	3070
Surana, N. S.	5134
Sutherland, J. G.	5102
Sweetman, A.	4013
Szaplonczay, (Mrs.) A. M.	3094
Szolary, L.	3075
Takahashi, S.	3009
Tamberg, K. G.	5034–5036
Taneja, J.	5114
Taylor, J. C.	3034
Taylor, M. K.	5167
Teale, A. R.	5157
Teasdale, B. F.	3058
Tehrani, G.	1023–1025, 1030
Templeton, J. G. C.	5060

Thipphawong, B.	1071, 1072, 1078, 1079
Thomas, G. H. S.	3027
Thomas, R. E.	8052
Thompson, C. J.	7085
Thompson, D.	8023
Thompson, L.	8044
Thorburn, G. A.	1039
Tiede, H.	5016, 5032, 5033
Tilston, W. V.	5206-5208
Tolmie, R. W.	5112, 7084, 7085
Tolten, B.	1006, 1015
Toomver, T.	5108
Tremere, A. W.	1087-1090, 7094-7097
Trent, R.	3061
Truksa, L. K.	3077
Truscott, J. H. L.	1033
Tuemer, A.	3002, 4009, 4010
Turnbull, J. N.	5171
Turner, R. R.	3042, 5096
Tyler, A. R.	5172
Tyminski, A.	3085
Urban, P.	8033
Vajdic, A. H.	7081
Vanderleck, J. M.	5059, 5060
VanDyk, G.	7082
Vasisht, R. C.	3100, 3101
Viant, M.	5216, 5219
Vijan, P. N.	3003-3005, 4009, 4010
Vincent, D. A.	8045
Vincze, L. J.	5073
Vivyrka, A. J.	3109
Wadden, C. G.	5146
Wagerer, G.	5165
Wainwright, F.	3059
Walker, R. W.	5192, 5193
Walker, W.	3061, 3062
Wall, C.	7102, 7103

Walsh, J. B.	4011
Walter, H.	1016
Wang, K. T.	4016
Warner, Joyce E.	1034
Watson, T. W.	5134, 5136
Watson, W.	5061-5063
Webb, G. G.	3057, 7091
Wells, D.	7077, 7078
Wenkoff, M. P.	8016
Wesolowski, A.	5175
West, G. H.	5064
Westwood, P.	5143
Whatmough, R.	5052-5054
Wherry, F. E.	5163
Whitaker, W.	5108
White, J. J.	8053
Whittaker, D.	5109
Wiebe, J.	1023, 1024, 1026
Wild, A. W.	5141
Wile, (Mrs.) I.	7079
Wilkins, R.	4016
Wilkinson, R. G.	5160
Williams, F. D. M.	5074-5076
Williams, J. R. M.	4001
Williams, M. J.	3036
Williams, P.	3060-3062, 4021
Williamson, F. D.	5114
Wilson, P.	5015, 5016
Winfield, R. G.	1075, 1076, 1080-1082, 2001
Winrow, D.	5167
Winthrop, S. O.	3086
Wise, M. E.	3045, 5110
Witty, R.	7092
Wolf, C. A.	5215
Wong, E. W.	3029
Wood, T.	8013, 8015
Wright, M. M.	3064-3066, 5136
Wu, J. C.	3110, 5213
Wysiekierski, A. G.	5128

Yakutchik, T. J.	4016–4019
Yan, M. M.	3039, 8007
Young, G.	3041
Young, W.	8044
Zakaib, D. D.	3049–3051
Zalkowitz, R. S.	3122
Zawidzki, T. W.	5159
Zelinger, G.	5148
Zepic, Z.	5169
Zoma, C. T.	3088
Zufa, L.	6034
Zutrauen, S.	5175

SUBJECT INDEX

As in previous editions, this index has been designed to be the basic cross-reference for any person who wants to know what is being done in Ontario (Universities excepted) with respect to research on a particular item, idea or area. We have therefore listed all submissions to the Index under at least three headings:

- (a) the field of investigation (designated by the investigator) such as analytical chemistry, electrical engineering, metallurgy; and
- (b) materials or products, such as herbicides, power transmission, computer applications; and
- (c) identifiable objects e.g., corn, iron or sweet potatoes, concrete.

In addition to this listing we have selected certain key words from the description provided by the responders and have added these to this Index. For example, anyone interested in the general field of paving materials should consult the projects listed under asphalt, cement, sealing compounds as well as test methods and measurements.

Obviously this cross-index cannot be complete so we urge any reader to use his own intelligence and skim through the final and significant part of the Index. That is the Directory of Projects starting on page 59. Here you will find, under appropriate headings, all the research, all the people, and all the points of contact you need to discover what is happening in research in the scientific and engineering fields in Ontario.

Accelerators, particle 8037

Acids,

 animo 1088, 1089, 7095-7097, 7110

 fatty 3019

 fluosilicic 3072

 gasses 3121

- Acoustics 8024, 8025, 8038, 8044
Activated sludge 5080
Adhesion, metallurgy 5194
Adhesives, wood 3100, 3101
Aerodynamic stability 8027
Aerodynamics 5153, 5154
Aeronautical engineering 5184, 8042
Aerophysics 5153, 5154, 8042
Afforestation 6030, 6033
Agricultural biology 1068, 1069, 1073, 1084, 1085
Agricultural economics 1001–1020, 1052
Agricultural engineering 1038, 1039, 1075, 1076, 1080–1082, 2001
Agricultural product storage 1027, 1033
Agronomy 1040–1043, 1046, 1053–1066, 1069, 1071–1073, 1075, 1078, 1079, 1083
Air pollution 3003, 3031, 3034, 3061, 5039, 5077, 8010–8015
Alfalfa 1066
Algae 5090, 7075, 7079, 7081
Algicides 7079
Alkalinity, water 7059
Alloys,
 - aluminum 5097, 5098, 5100, 5102
 - copper 5070, 5072
 - gold-silver 5194
 - magnetic 5196
 - steel 5104–5108
 - zinc 3063, 5134, 5139–5141
 - zirconium 5128, 5130
Alpha-olefins 5214
Alumina 8035
Aluminum 3005, 3072, 5097–5102, 5168, 8008
Aluminum alloys 5097, 5098, 5100, 5102
Amino acids 1088, 1089, 7095–7097, 7110
Ammonium diuranate 3109
Amplifiers 5192, 5216–5219
Analysis and functional analysis 3117, 5150, 5182, 8044, 8054
Analytical chemistry 3001–3005, 3019, 3020, 3025, 3028, 3034, 3037, 3049, 3060, 3061, 3081, 3106, 3117
Animal husbandry 1035, 1036, 1047–1051, 1076, 1082, 1085, 1087–1090, 7094–7098

- Animal nutrition 1035, 1047–1051, 1082, 1085, 1087–1090,
7001–7007, 7009, 7010, 7049, 7052, 7055, 7090, 7092, 7094–7097,
7106, 7108, 7109
- Animals,
 agricultural (see cattle, chickens, pigs, turkeys, etc.)
 wild (see wildlife)
- Anodizing, aluminum 5101
- Antennas & masts 5204, 5206, 5208–5210
- Apples 1001, 1030
- Appliance and instrument design 1038, 1039, 5113, 5114, 5126, 5131,
5170–5172, 5182, 5184–5188, 5190–5193, 5197–5199,
5209–5212, 8016, 8054, 8055
- Appliance and instrument development 3013, 3031, 3034, 3106, 4003,
4020, 4022–4024, 5038, 5041, 5046, 5047, 5055, 5061, 5075, 5096,
5110, 5112, 5142, 5148, 5167, 5173–5178, 5186, 5192, 5194, 5195,
5201–5205, 5207, 5216–5219, 7082, 7083, 7086, 8006, 8011,
8045, 8052
- Apricots 1030
- Aquatic engineering 5078–5092, 7081
- Arctic Grayling 7061
- Artificial regeneration, trees 6025
- Ash trees 6020
- Asphalt 3010, 3046, 5002, 5008–5011, 5021
- Attractants, insect 3022
- Bacon 3056
- Bacterial ecology 7072–7074
- Bacteriology 1044, 1068, 1069, 1073, 3107, 7073, 7091, 7099
- Baking 3089
- Ballistics, interior 8026
- Balsam firs 3023
- Barley 1055, 1056, 1058, 1061, 1064, 1065, 1067, 1077–1079
- Basins, drainage 4013, 4014, 4016–4019
- Bass, smallmouth 7042, 7045–7048
- Basswood, American 6020, 6032
- Batteries 3066, 3087, 5164, 5211, 5212
- Bauxite 3072
- Beaches, erosion 5093
- Beacons, emergency, radio 5176

Beans,
field 1071, 1072, 1074
green 1005
kidney 1073
lima 1073
soy 1042, 1043, 1051, 1067, 1071–1073, 1077, 7092
wax 1005
white 1040, 1041, 1043, 1073

Bearings 8042

Bears,
black 7064
polar 7064

Beaver 7066

Beef cattle 1035, 7002, 7009

Beets 1069

Bentonite 5037

Biochemistry 3038, 3039, 7067, 7070, 7071, 7084, 7085, 7087–7089,
7098, 7100, 7101, 7103, 7105, 7107, 7110, 7111

Biology,
agricultural 1068, 1069, 1073, 1084, 1085
aquatic 7080, 7081
cell 7100–7102, 7107, 7110, 7111

Birds,
farm (see chickens and turkeys.)
waterfowl 7065
wild 7065

Birdsfoot trefoil 1066

Bismuth 4004

Bituminous paving 5002, 5006–5008

Blackflies 7068, 7069

Bleaching 3036

Boiler tubes 5057

Botany 1069, 1073, 1086, 3038, 6035, 7075, 7079, 7093

Breeding,
fish 7015
trees 6034

Bridges 5003–5005, 5013, 5015, 5018, 5034–5036

Brome grass 1063

Butterfat 1090

- Cable testers 5038
Cadmium 4004, 5211, 5212
Calcium 3078, 4004
Calcium zirconate 3078
Calorimetry 5118
Canada geese 7065
Capacitors,
 electrolytic 3110, 5181, 5213
 power 5126
Carbohydrates 1089, 3026, 3027, 3081
Carbon 3060, 3062
Caribou 7063
Cartography 4001, 4003, 4005, 4006, 4008, 4012
Casting 5103, 5107, 5138–5140
Casting,
 continuous 5138
 die 5107, 5139
Catalysis 3016, 3031, 3115
Cattle,
 beef 1035, 7002, 7009
 dairy 1035, 7001, 7097
Cedars 3008
Ceilometers 5184
Cell biology 7100–7102, 7107, 7110, 7111
Cellulose 3035, 3038, 3084
Cement 3011, 4004
Ceramics 3013–3016, 3078, 3079, 4004, 8033–8035
Cereals 1040–1043, 1053, 1055–1061, 1064, 1065, 1073
Cheeses 1019, 1044, 1045, 1052
Chemical and physical processes 5213
Chemical and physical properties 3001, 3010–3012, 3015, 3023, 3024,
 3035, 3036, 3039, 3042, 3043, 3046, 3051, 3060, 3083–3085,
 3087, 3088, 3097, 3114, 3122, 4009, 4010, 5001, 5031, 5032,
 5048–5050, 5066, 5100, 5108, 5135, 5209, 5210, 5213, 6009, 7067,
 7093, 8002–8005, 8007, 8017, 8022, 8031–8035, 8038–8041, 8055
Chemical engineering 3006–3009, 3059, 3061, 3102–3105, 3107–3109,
 3116, 5001, 5039, 5048–5050, 5077, 5094, 5095, 5183, 5214, 5215
Chemical reaction, kinetics 3099, 3100, 3113, 3119

Chemistry,
analytical 3001–3005, 3019, 3020, 3025, 3028, 3034, 3037,
3049, 3060, 3061, 3081, 3106, 3117
biochemistry 3038, 3039, 7067, 7070, 7071, 7084, 7085,
7087–7089, 7098, 7100, 7101, 7103, 7105, 7107, 7110, 7111
electrochemistry 3040, 3041, 3065, 3073, 3074
food 3052–3059, 3062, 3086, 3089–3091, 3095, 3096, 7091
geochemistry 4007, 4011, 4021
inorganic 3011, 3012, 3015, 3033, 3063, 3064, 3066–3072, 3075,
3076, 3088, 3094, 3099, 3101, 3103, 3105, 3106, 3108,
3109, 4007, 5039, 5077, 5183
materials 3010–3012, 3014, 3015
metallurgical 3105, 3107
organic 3006–3010, 3017–3022, 3026–3029, 3032, 3035, 3036,
3038, 3039, 3046–3048, 3050, 3051, 3062, 3064, 3077, 3080,
3082–3086, 3092, 3093, 3106, 3111, 3112, 3118, 3121,
3122, 5214, 5215, 6036, 6037, 7098, 7099
petroleum 5214
physical 3010–3012, 3014, 3016, 3028–3030, 3032, 3042, 3062,
3080, 3084, 3106, 3109, 3113–3116, 3119, 5096
polymer 3029, 3032, 3043, 3044, 3067, 3068, 3076, 3077, 3084,
3097, 3098, 3100, 3111–3115, 3118–3120, 3122
solid state 3013, 5211
surface 3010
thermochemistry 3030, 3031
Chemistry laboratories 2002
Cherries 1016, 1030
Cherry trees 6017, 6020
Chickens 1047–1051, 7004, 7005, 7007
Chlorates 3073
Chlorides 3033, 3073
Chlorine dioxide 3071
Chromatography 3009, 3081, 3117, 5021
Chromium 4004
Chromophores 3085
Chymotrypsin 7088
Chrysanthemum 1032
Circuits 8043
Circuit breakers 5041
Civil engineering 5002–5036, 5093, 5125, 5161

- Classrooms 2004, 2008, 2009, 2012
Clay products 5125, 5161
Clays 3016, 4007, 4010, 5125, 5161
Clays, fireclay 4007
Clematis 1032
Climate, micro-climate 1026
Coatings 3040, 3041, 3063, 3064, 3101, 5058, 5135, 5136, 5191
Cobalt 4004
Coercive force, magnetism 5196
Colloids 3097
Columbium 4004
Commercial fishing 7018–7023, 7040
Communications, power systems 5052–5054
Computer applications 2005, 4007, 4022, 5045, 5056, 5063, 5076,
5110, 5122–5124, 5143, 5145–5147, 5182, 5185, 5189, 5190, 5220,
6026, 7085, 8043, 8044, 8046, 8052
Computer engineering 5143, 5145–5147, 5182, 5185, 5190, 5220, 8044
Concrete 5010–5013, 5015, 5031–5033
Conductivity, semiconductors 3013, 3015, 8002, 8020, 8021,
8045–8047, 8052
Cones, conifers 6030
Conifers (see softwoods)
Construction materials 2001, 8024
Control systems 5055, 5122–5124, 5155, 5166, 5173, 5175
Conversion, power 5174
Copper 3107, 3108, 4004, 5070, 5072
Copper alloys 5070, 5072
Copper oxide 5072
Corn 1031, 1040–1043, 1046–1049, 1067–1069, 1071, 1072,
1075–1077, 1080–1082, 7001, 7002
Corn cob meal 1047–1049
Corn silage 7001, 7002
Corona 5121, 5163, 5165, 5169
Corrosion 3063, 3064, 5048, 5058, 5097, 5114, 5129
Cotton 3112
Cottonwoods 6016, 6020
Coulometers 5211, 5212
Coyotes 7064
Cream 1037
Creep in metals 5040, 5134

- Crop husbandry 1040, 1041, 1043, 1053–1055, 1064, 1065, 1071, 1072, 1075, 1078, 1079
Crop management 1012, 1013, 1067, 1070, 1077, 1079
Crops,
 field (see also barley, brome grass, cereals, corn, crested wheat grass, feeds, forage crops, grains, oats, oil seeds, rape seed, reed canary grass, rice, soybeans, timothy, tobacco, wheat)
 1006, 1012, 1013, 1015, 1031, 1040–1043, 1046, 1047–1049, 1051, 1053–1073, 1075–1084, 7001
 forage 1015, 1040–1042, 1054, 1063, 1071, 1072
 ornamental 1023, 1032
Crystal physics 8005, 8036
Crystallography 8048, 8051
Cucumbers 1031, 1073, 1074
Currants 1030
Cyclopentadiene 3018
- Dairy cattle 1035, 7001, 7097
Dairy products 1017–1019, 1037, 1044, 1045, 1052
Dairy science 1019, 1090, 7097
Data processing 5117, 5120
Deer 7063
Detection methods 8009
Detergents 3086, 3095, 7046
Dielectrics 3110, 5042–5044, 5121, 5127, 5169, 5213, 8018, 8019, 8021, 8049, 8050, 8053
Differential thermal analysis 3030
Diffusion 3116, 8053
Dioxides,
 chlorine 3071
 sulphur 5039, 5077, 8010
Display & plotting systems 4020, 5056, 5110, 5144, 5167, 5170, 5172, 8018, 8036
Dissolved solids, water 7059
Diuranate, ammonium 3109
Drainage basins 4013, 4014, 4016–4019
Drainage, forests 6023
Drilling fluids 5088
Drug testing 7101, 7103–7110
Dry matter crops 1054, 1063, 1066

- Dryer felts 3112
Ductility 5134
Duplexers 5207
Dutch elm disease 6016
Dykes 5153
Dynamics, gas 8026
- Ecology,
 bacterial 7072–7074
 fish 7011, 7014, 7016–7023, 7026–7038, 7040–7051, 7055–7088.
 7060, 7061, 7076
 trees 6001, 6003, 6010, 6022
 wildlife 7062–7066
- Educational facilities 2002–2004, 2006–2016
- Eel, American 7021
- Eggs 1048, 1049, 1085, 7008
- Elastomers 8032
- Electrical engineering 4020, 4023, 4024, 5038, 5041–5047, 5052–5056.
 5059–5063, 5111, 5117, 5120, 5121, 5126, 5127, 5131, 5142, 5148,
 5162–5177, 5179–5181, 5186–5188, 5191–5193, 5195, 5197–5208,
 5211–5213, 5216–5219, 8038, 8043
- Electrical insulation 5042, 5043, 5050, 5121, 5127, 5163, 5165,
 5169, 8045
- Electrical metering 5060
- Electrochemistry 3040, 3041, 3065, 3073, 3074
- Electrodeposition 3040, 3041, 5191
- Electrodes 3073, 3087
- Electrodynamics 8043
- Electrolysis 3073, 3074
- Electrolytic capacitors 3110, 5181, 5213
- Electro-magnetic induction 4023, 5177
- Electron microscopy 7093, 7100–7102, 7104, 7105, 7107, 7111,
 8001, 8004
- Electron physics 8001, 8004, 8037
- Electronics 3013–3015, 5041–5047, 5052–5056, 5059–5063, 5112,
 5142, 5144, 5148, 5173–5181, 5184, 5187, 5188, 5191–5193,
 5197–5199, 5200–5208, 5216–5219, 8017–8020, 8036, 8043
- Electroslag 5109
- Elements, trace 1070
- Elm 6016

Emergency beacons, radio 5176
Emulsification 5071
Engineering,
 aeronautical 5184, 8042
 agricultural 1038, 1039, 1075, 1076, 1080–1082, 2001
 aquatic 5078–5092, 7081
 chemical 3006–3009, 3059, 3061, 3102–3105, 3107–3109, 3116,
 5001, 5039, 5048–5050, 5077, 5094, 5095, 5183, 5214, 5215
 civil 5002–5036, 5093, 5125, 5161
 computer 5143, 5145–5147, 5182, 5185, 5220, 8044
 electrical 4020, 4023, 4024, 5038, 5041–5047, 5052–5056,
 5059–5063, 5111, 5117, 5120, 5121, 5126, 5127, 5131, 5142,
 5148, 5162–5177, 5179–5181, 5186–5188, 5191–5193, 5195,
 5197–5208, 5211–5213, 5216–5219, 8038, 8043
 environmental 5064
 mechanical 5001, 5038, 5051, 5074, 5075, 5118, 5132, 5133,
 5135, 5137, 5149, 5151, 5154, 5173–5176, 5209, 5210, 8006
 metallurgical 3102–3109, 5037, 5040, 5057, 5058, 5066–5070,
 5072, 5073, 5096–5109, 5115, 5116, 5129, 5134–5141,
 5159, 5194, 5196, 8008
 mining 3045, 5038, 5123
 nuclear 5110–5112, 5129, 5149, 5150, 5152, 5155, 5156, 7082,
 7083, 8029
 petroleum 5214
 sanitary 5065, 5078, 5079, 5081–5083, 5086, 5087, 5089–5092
Enthalpy, water 8029
Entomology 1068, 7068, 7069, 7076, 7077, 7079
Environmental engineering 5064
Enzymes 7070, 7087, 7088
Epitaxy 8049
Epoxides 3028, 3029
Equilibria, vapour-liquid 3051
Erosion, beaches 5093
Eutectic composites 5067
Eutrophication, plankton 7052
Exploration, gas and oil 4021
Extraction, solvent 3104
Extractive metallurgy 3033, 3108, 3109
Extrusion, zinc 5137

- Facilities, educational 2002–2004, 2006–2016
Fatigue, metal 5066, 5102, 5107
Fats 1090, 3020, 3058, 3086, 3096, 7090
Fatty acids 3019
Felting 3111
Felts, dryer 3112
Ferrite 3094, 8048, 8051
Fertility, soil 1042, 1067, 1070, 1077, 3016
Fertilizers 1023, 1053–1056, 6021
Fibreboard 3039, 8007
Fibres 3035, 7093, 8041
Field crops (see also barley, brome grass, cereals, corn, crested wheat grass)
 feeds, forage crops, grains, oats, oil seeds, rape seed, reed canary
 grass, rice, soybeans, timothy, tobacco, wheat)
 1006, 1012, 1013, 1015, 1031, 1040–1043, 1046, 1047–1049,
 1051, 1053–1073, 1075–1084, 7001
Filter fabrics 3112
Fire resistance 3035, 5001, 8007
Fireclay 4007
Firs 3023, 6022
Fish (see also under name of genus of fish) 1084, 7011–7061,
 7076–7078, 7092
Fish,
 breeding 7015
 detergents, sub-lethal effects 7046
 diseases 7012
 ecology 7001, 7014, 7016–7023, 7026–7038, 7040–7051,
 7055–7058, 7060, 7061, 7076
 genetics 7012–7015
 limnology 7044, 7052–7054, 7059
 meal 7092
 parasites 7024, 7025
 spawning facilities 7034
 toxicants 7035
Fisheries management 7013, 7015, 7019, 7022, 7023, 7027, 7028, 7031,
 7033–7035, 7038, 7039, 7049, 7050, 7058, 7060
Fishing,
 commercial 7018–7023, 7040
 sport 7019, 7022, 7023, 7040, 7042, 7061
Fishing gear 7028, 7056

- Flight instruments 5184
Flowers 1007, 1032
Fluidization 3116
Fluids, physics of 8026, 8028, 8029
Fluorescence 8017-8019
Fluorides 3028, 3034, 3072
Fluosilicic acid 3072
Foliage utilization 6036
Food Chemistry 3052-3059, 3062, 3086, 3089-3091, 3095, 3096, 7091
Food mixes 3090
Food preservation 1080, 1081, 1084
Food processing 3052-3057, 3089, 3091, 7091, 7092
Foods, pet 3091
Forage crops 1015, 1040-1042, 1054, 1063, 1071, 1072
Forest management 6016-6021, 6024, 6025, 6027-6029, 6032-6034
Forest products 3023, 3100, 3101, 6009, 6014, 6015, 6035-6037
Forest products (see wood products, wood, pulps)
Forestry economics 6012-6015
Forging 5141
Formability, plastic 5134
Formaldehyde 3099, 3100
Fowl (see birds, wild and farm)
Friction 8042
Fruit (see also under name of genus of fruit) 1001, 1003, 1009, 1016,
 1022-1030, 1033, 1034, 1039, 1084
Fruit concentrates .1022
Fruit juices 1022
Fruit products 1034
Fruit syrups 1022
Fuel cells 5164
Functional analysis 3117, 5150, 5182, 8044, 8053
Fur bearing animals 7064, 7066

Galvanizing 5135, 5136
Gamma rays and irradiation 1084-1086, 3043, 3044, 5065, 5178,
 7082, 7083, 7085
Gas,
 dynamics 8026
 exploration 4021
 in metals 8008

- Gas physics 8042
Geese, Canada 7065
Gelatine 3059
Generators 8037
Genetics, fish 7012–7015
Geochemistry 4007, 4011, 4021
Geography 4005, 4006, 4008
Geological mapping 4005, 4006, 4008
Geology 3001, 4003–4010, 4012–4019
Geophysics 4020, 4022–4024, 8038
Germanium 8005
Germanium oxide 3014
Germicides 7099
Germination, trees 6031, 6032
Gladiolus 1032
Glass 3013–3016, 8034
Glugea hertwigi 7024
Gold 4004, 4011, 5194
Gold-silver alloys 5194
Grains 1006, 1020, 1040–1043, 1058, 1059, 1061, 1064, 1065,
1067, 1077–1079, 1084, 7001, 7006 7090
Grapes 1030
Grass,
 brome 1063
 crested wheat 1053
 legume 1054
 reed canary 1053, 1063
Gravel 4004
Graylings, Arctic 7061
Greases 3046
Greenhouse vegetables & flowers 1002, 1007
Groundwater 4014, 4015
Groundwood 3083, 5095
Grouse 7065
Gypsum 3012

Ham 3056
Hardwoods 6001, 6002, 6016–6018, 6020, 6022, 6024, 6027, 6028,
6032, 6034
Hay 1063, 1066

Heat exchangers 5113, 5114
Heat transfer 5118, 5152, 5215
Heating, residential 5064
Heparin 7089
Herbicides 3006, 6019, 6029, 7079
Highways,
 construction 5005–5007, 5010, 5011, 5013, 5015, 5021,
 5022, 5028, 5030
 construction–bridges 5005, 5013, 5015
 design 5004, 5020, 5024–5028, 5033, 5034, 5036
 design–bridges 5004, 5018, 5034, 5036
 maintenance 5009
 management 5023
 materials 5010–5014, 5031
 safety 5014, 5019
Holly 1032
Horticultural crops 1024–1026
Horticulture 1007, 1016, 1021–1034, 1039, 1069, 1073, 1074
Humus 6007
Husbandry,
 animal 1035, 1036, 1047–1051, 1076, 1082, 1085,
 1087–1090, 7094–7098
 crop 1040, 1041, 1043, 1053–1055, 1064, 1065, 1071,
 1072, 1075, 1078, 1079
Hydrocarbons 3117
Hydrogen 3060, 3062, 8008
Hydrogenation 3047, 3096
Hydrology 4013–4019
Hydro-metallurgy 3102, 3104

Immunology 1044, 1068, 1069, 1073, 7072–7074, 7091, 7099, 7109
Impact testing 5019
Induced Polarization 4024
Induction, electro-magnetic 4023
Industrial arts rooms 2008
Industrial minerals 4004
Industrial waste treatment 5081, 7098
Infrared properties 8022
Infrared spectrophotometry 3019

- Inorganic chemistry 3011, 3012, 3015, 3033, 3063, 3064, 3066–3072, 3075, 3076, 3088, 3094, 3099, 3101, 3103, 3105, 3106, 3108, 3109, 4007, 5039, 5077, 5183
- Insect attractants 3022
- Insecticides 7079
- Instructional materials centre 2003
- Instrument and appliance design 1038, 1039, 5113, 5114, 5126, 5131, 5170–5172, 5182, 5184–5188, 5190–5193, 5197–5199, 5209–5212, 8016, 8054, 8055
- Instrument and appliance development 3013, 3031, 3034, 3106, 4003, 4020, 4022–4024, 5038, 5041, 5046, 5047, 5055, 5061, 5075, 5096, 5110–5112, 5142, 5148, 5167, 5173–5178, 5186, 5192, 5194, 5195, 5201–5205, 5207, 5216–5219, 7082, 7083, 7086, 8006, 8011, 8045, 8052
- Insulation, electrical 5042, 5043, 5050, 5121, 5127, 5163, 5165, 5169, 8045
- Ion exchange 3109
- Iron 4004, 5037, 5073
- Iron pellets 5037, 5073
- Irradiation, gamma 1084–1086, 3043, 3044, 5065, 5178, 7082, 7083, 7085
- Isotopes 3060, 3062
- Kaolin 4007
- Klystrons 5218, 5219
- Kokanee sockeye salmon 7022, 7023
- Laboratories,
 chemistry 2002
 sciences 2012
- Lagoons 5078
- Lamprey 7016, 7018
- Land classification 4001
- Latex 3097
- Lazers 8044
- Leaching, uranium 3105, 3107
- Lead 3066, 4004, 5134, 5138, 8024
- Lead metaniobate 8033
- Leather 7087
- Legume grass 1054

- Legumes 1073
Libraries 2010, 2013
Lignin 3017, 3082
Lignite 4007
Lilly 1032
Limnology, fish 7044, 7052–7054, 7059
Liquid metals 5149, 5156
Livers 7100, 7107
Livestock 1008, 1012, 1013, 1015, 1035, 1036, 7001, 7002, 7009
 7010, 7095–7097
Lock coil ropes 5038
Lubrication 5215
Luminescence 8017–8019
Lysine 1088, 7096
- Magnesia refractories 5159
Magnesium 4004
Magnetic alloys 5196
Magnetic field 5172
Magnetic resonance, nuclear 3027, 3028
Magnetostriction 5196
Magnets 5172, 8037
Manganese 3094, 4004, 8051
Maple syrup and sap 6018
Maples 6001, 6002, 6016–6018, 6020
Mapping 4001, 4003, 4005, 4006, 4008, 4012
Mapping, geological 4005, 4006, 4008
Margarine 3058
Mass transfer 5156
Masts and antennas 5204, 5206, 5208–5210
Materials, chemistry 3010–3012, 3014, 3015
Mathematical analysis 5150, 5182, 8044
Mathematical physics 8044
Meal,
 corn cob 1047–1049
 fish 7092
 meat 7092
 rape seed 7092
 soybean 7092

- Measurements and test methods 1030–1032, 1041, 1075, 3002–3005, 3009, 3025, 3030, 3037, 3060, 4011, 4022, 5001, 5002, 5015, 5016, 5019, 5020, 5024, 5025, 5029, 5030, 5032, 5041, 5060, 5068, 5086, 5087, 5092, 5112, 5118, 5119, 5121, 5165, 5200, 7081, 8012–8015, 8038
- Meat processing 3052–3057, 7091, 7092
- Mechanical engineering 5001, 5038, 5051, 5074, 5075, 5118, 5132, 5133, 5135, 5137, 5149, 5151, 5154, 5173–5176, 5209, 5210, 8006
- Mechanical seals 5132, 5133
- Mechanics 8006, 8027, 8043
- Metal contacts 5194
- Metal fatigue 5066, 5102, 5107
- Metal physics 5066, 8008
- Metallurgical chemistry 3105, 3107
- Metallurgical engineering 3102–3109, 5037, 5040, 5057, 5058, 5066–5070, 5072, 5073, 5096–5109, 5115, 5116, 5129, 5134–5141, 5159, 5194, 5196, 8008
- Metallurgy 3033, 3045, 3102, 3104, 5040, 5057, 5058, 5067–5070, 5097–5109, 5115, 5116, 5119, 5128–5130, 5134–5141, 5157–5160, 8008, 8020, 8021, 8048, 8051
- Metallurgy,
 extractive 3033, 3108, 3109
 hydro 3102, 3104
- Meteor detection 8054
- Meteoroids 8028
- Meteorology 5205, 7044
- Metering, electrical 5060
- Methodology 3004, 3005, 3009, 3025, 3060–3062, 3071, 3072, 3098, 4021–4024, 5077, 5079, 5091, 5125, 5143–5146, 5161, 5163, 5168, 5195, 6004–6006, 7068, 7085, 7105, 7111, 8009, 8013–8015, 8054
- Mica 4004
- Microbiology 1044, 5085, 7070–7074, 7091, 7099
- Micro-climate 1026
- Microphones 5186
- Microprobes 8001
- Microscopy, electron 7093, 7100–7102, 7104, 7105, 7107, 7111, 8001, 8004
- Microwaves 5052, 5148, 5216
- Milk 1018, 1090

Minerals, industrial 4004
Mining engineering 3045, 5038, 5123
Mink 7094
Molecular physics 8030, 8032
Moose 7063
Mosquitoes 7069
Mullite 3079
Multicouplers 5201–5203, 5208
Mushrooms 1084

Navigation systems 5147, 8043
Neoprene 5004
Neutron activation 4011
Neutron beam, analysis 3045, 7085
Newsprint 5094
Nickel 4004, 5211, 5212, 8048
Nitrates, thorium 3103
Nitric oxide 8014
Nitrogen 1053, 1055, 1056, 1065, 1077, 3037, 3060, 3062
Nitrogen dioxide 8010
Nitrous oxide 8010, 8014
Noise 5114
Nuclear engineering 5110–5112, 5129, 5149, 5150, 5152, 5155,
5156, 7082, 7083, 8029
Nuclear magnetic resonance 3027, 3028
Nuclear reactors 5152, 5155
Nutrition,
 animal 1035, 1047–1051, 1082, 1085, 1087–1090, 7001–7007,
 7009, 7010, 7049, 7052, 7055, 7090, 7092, 7094–7097,
 7106, 7108, 7109
 plant 1023, 1053, 1055, 1056, 1065, 1070, 1077, 6007, 6010,
 6011, 6021

Oaks 6017
Oats 1058, 1061, 1064, 1078, 1079
Occupational shops 2011
Oceanography 8038
Oil,
 exploration 4021
 food 1040, 1041, 1057, 1062, 3020, 3058, 3086, 3092

- petroleum 3046–3049, 4021, 5048–5050, 5163, 5165
seeds 1040, 1041
- Olefins 5214
- Optics 5167, 8016, 8028, 8036, 8044, 8054, 8055
- Ore dressing 5037, 5069, 5073
- Organic chemistry 3006–3010, 3017–3022, 3026–3029, 3032, 3035,
3036, 3038, 3039, 3046–3048, 3050, 3051, 3062, 3064, 3077, 3080,
3082–3086, 3092, 3093, 3106, 3111, 3112, 3118, 3121, 3122,
5214, 5215, 6036, 6037, 7098, 7099
- Ornamental crops and plants 1023, 1032
- Oscillators 5216–5219
- Osmosis, reverse 3032, 5074
- Otters 7066
- Oxides,
copper 5072
germanium 3014
nitric 8014
nitrous 8010, 8014
thorium 3103
- Oxiranes 3120
- Oxygen 3060, 3062
- Packaging, vacuum 7091
- Paints 3093
- Paper 3023, 3024, 3085, 3112, 5094, 5124, 5165, 6037, 7093,
8006, 8039, 8040
- Parasites,
fish 7024, 7025
wildlife 7062
- Particle accelerators 8037
- Pattern recognition systems 8044
- Pavements 5002, 5006–5011, 5015, 5016, 5021, 5022, 5028,
5029, 5032, 5033
- Pavings,
asphalt 3010, 5002, 5008–5011, 5021
bituminous 5002, 5006–5008
- Peaches 1016, 1030
- Pears 1030
- Peas 1060, 1069
- Peat moss 4004, 5037

- Pellets,
 chicken feed 1049
 iron 5037, 5073
- Peppers 1031
- Perch 7019, 7041
- Peroxides 3082
- Pesticides 3025, 7068, 7069, 7078, 7079
- Pet foods 3091
- Petroleum and petrochemicals 3046–3050, 4021, 5048–5050,
 5163, 5165
- Petroleum chemistry 5214
- Petroleum engineering 5214
- Phenol-formaldehyde 3099, 3100
- Phosphates 3016
- Phosphorous 1055, 1077, 3037
- Photoconductivity 8017
- Photogrammetry 4003, 4006
- Physical and chemical properties 3001, 3010–3012, 3015, 3023, 3024,
 3035, 3036, 3039, 3042, 3043, 3046, 3051, 3060, 3083–3085,
 3087, 3088, 3097, 3114, 3122, 4009, 4010, 5001, 5031, 5032,
 5048–5050, 5066, 5100, 5108, 5135, 5209, 5210, 5213, 6009, 7067,
 7093, 8002–8005, 8007, 8017, 8022, 8031–8035, 8038–8041, 8055
- Physical chemistry 3010–3012, 3014, 3016, 3028–3030, 3032, 3042,
 3062, 3080, 3084, 3106, 3109, 3113–3116, 3119, 5096
- Physics,
 acoustics 8024, 8025, 8038, 8044
 aerophysics 5153, 5154, 8042
 crystal 8005, 8036
 electron 8001, 8004, 8037
 gas 8042
 geophysics 4020, 4022–4024, 8038
 mathematical 8044
 mechanics 8006, 8027, 8043
 metal 5066, 8008
 molecular 8030, 8032
 optics 5167, 8016, 8028, 8036, 8044, 8054, 8055
 solid state 5166, 5175, 5211, 8002, 8004, 8005, 8047, 8050, 8053
 theoretical 8044
- Physics of fluids 8026, 8028, 8029
- Physiography 4001, 4012

- Physiology 6002, 7009, 7010
Phytoplankton 7075, 7080
Piezoactivity 8033
Pigs 1008, 1036, 7010, 7095, 7096
Pines 5095, 6003, 6022, 6034
Plankton 7049, 7052, 7075, 7080
Plant nutrition 1023, 1053, 1055, 1056, 1065, 1070, 1077,
 6007, 6010, 6011, 6021
Plastic formability 5134
Plastics 3101, 5043, 5044, 8032
Platinum 4004
Plums 1030
Polarization, induced 4024
Pollution,
 air 3003, 3031, 3034, 3061, 5039, 5077, 8010–8015
 water 3032, 7067, 7072, 7076–7079
Pollution control,
 air 3061, 5077
 water 3037, 5078, 5080–5087, 7080, 7081, 7098
Polyethylene 3114, 5044
Polymerization 3007, 3029, 3032, 3043, 3044, 3067, 3068, 3076, 3084,
 3097, 3098, 3100, 3111–3115, 3118–3120, 5215, 8030, 8031
Polymers (see polymerization)
Polysaccharides 3080
Poplars 6017, 6034
Porosity, aluminum 5099
Portable classrooms 2009
Potassium 1077, 3088
Potatoes 1031, 1073
Potatoes, sweet 1031
Poultry (see poultry science, chickens, turkeys)
Poultry science 1047–1051, 1084, 1085, 1087–1089, 7003–7008,
 7090, 7092
Power capacitors 5126
Power conversion 5174
Power supplies 3087, 5111, 5174, 5191
Power system communications 5052–5054
Power system protection 5055, 5061
Power systems 5052–5055, 5059, 5061–5063
Power transformers 5059, 5131, 5163, 5168, 5169

Power transmission 5040, 5043–5045, 5051
Predators 7064
Prefabrication 5125, 5161, 7014
Preservation, food 1080, 1081, 1084
Preservatives, wood 3007–3009
Processing,
 data 5117, 5120
 food 3052–3057, 3089, 3091, 7091, 7092
 meat 3052–3057, 7091, 7092
Protein 1050, 1089, 7005, 7007, 7092, 7097, 7110
Pulp & paper 3023, 3038, 3080, 3083, 3085, 5095, 5124, 6037,
 7093, 8041

Radar 5148
Radio emergency beacons 5176
Radioactive tracer 7084
Radioisotopes 3045, 5111, 5112
Rape seed 1057, 1062
Rape seed meal 7092
Rare earths 3102
Raspberries 1016, 1030
Receivers 5186
Receiving stations 5205
Recording systems 5110
Reforestation 6025
Refractories 3078, 5159, 8004
Regeneration, artificial trees 6025
Regulators, voltage 5166
Residential heating 5064
Resins 3093, 3099, 3100, 6037
Resonance, nuclear magnetic 3027, 3028
Reverse osmosis 3032, 5074
Rheology 8031
Rhododendron 1032
Rhubarb 1031
Ribes, eradication 6029
Rice 1078, 1083
Rocks 3002, 4009
Rodent detector 7086

- Ropes, lock coil 5038
Rubber 3048
- St. Lawrence Seaway 7021
Salad oil 3058
Salmon, Kokanee sockeye 7022, 7023
Salmonella 1085
Sand 4004, 4007, 5157
Sanitary engineering 5065, 5078, 5079, 5081–5083, 5086, 5087, 5089–5092
Sap pressure 6008
Satellites, weather 5205
Sausage 3052, 3054
Science laboratories 2012
Sealing compounds 5012
Seismographs 5075
Selenium 4004
Semiconductors 3013, 3015, 8002, 8020, 8021, 8045–8047, 8052
Shaft seals 5132, 5133, 5151
Shales 4010
Shelf life, packaged foods 7091
Shock tubes 8029
Shops, technical and occupational 2011
Shore stabilization 5093
Shortening 3058
Shrubs, control 6019
Silage, corn 7001, 7002
Silica 3015
Silicon 8020–8023, 8045, 8052, 8053
Silver 4004, 5194
Silvicides 6019
Sludge, activated 5080
Smallmouth Bass 7042, 7045–7048
Smelts 7024, 7027–7029
Soaps 3086, 3095
Sodium 3002, 3071, 3088
Sodium sulphate 3071
Softwoods 3008, 6003, 6010, 6011, 6022, 6023, 6034, 6036
Soil.
 fertility 1042, 1067, 1070, 1077, 3016

moisture 6008, 6023
science 1023, 1042, 1046, 1053–1056, 1067, 1070, 1077, 4001,
4012, 6008, 6019, 6021, 6023
sterilants 6019
Solid state 3013, 5166, 5175, 5211, 8002, 8004, 8005, 8047, 8050, 8053
Solid state chemistry 3013, 5211
Solid state physics 5166, 5175, 5211, 8002, 8004, 8005, 8047,
8050, 8053
Solvent extraction 3104
Sonar 5189
Sound propagation 5187, 5193, 8025
Soybean meal 7092
Space research 5210, 8011, 8027, 8054, 8055
Spawning facilities–fish 7034
Spectrometers and Spectroscopes 3019, 3122, 5178, 8009–8015, 8028
Spectrophotometry, infrared 3019
Splake 7013, 7014, 7016
Spores 7071
Sport Fishing 7019, 7022, 7023, 7040, 7042, 7061
Spruces 6003, 6010, 6011, 6022, 6023, 6034
Stability, aerodynamic 8027
Stabilization, shore 5093
Stations, receiving 5205
Steel 5103–5109, 5115, 5116, 5119, 5135
Steel.
 alloy 5104, 5105
 stainless 5108
 tool 5106
Sterilants, soil 6019
Sterilization 7083
Storage, agricultural products 1027, 1033
Straw 1064
Strawberries 1003, 1016, 1030, 1069, 1084
Student centres 2015
Suckers 7036, 7041
Sugars 3081
Sulphates 3011, 3071
Sulphides 3067
Sulphur 3003, 3069, 5077
Sulphur dioxide 5039, 5077, 8010

- Sunflowers 1062
Superconductivity 8037
Surface-active agents 3021, 3095
Surface chemistry 3010
Surge protection, electrical 5045–5047
Surveying 4012
Swamps 6016
Sweet potatoes 1031
Syrups,
 fruit 1022
 maple 6018
- Tantalum 5181
Technical shops 2011
Telemetry 5142
Telephones 5188
Television, educational 2014
Tellurium 4004
Test methods and measurements 1030–1032, 1041, 1075, 3002–3005,
 3009, 3025, 3030, 3037, 3060, 4011, 4022, 5001, 5002, 5015, 5016,
 5019, 5024, 5025, 5029, 5030, 5032, 5041, 5060, 5068, 5086, 5087,
 5092, 5112, 5118, 5119, 5121, 5165, 5200, 7081, 8012–8015, 8038
Textiles 3035, 3036, 3043, 3111, 3112, 7099
Theoretical physics 8044
Thermal analysis, differential 3031
Thermal phenomena 5118, 5127, 5148, 5152, 5215
Thermal properties 3031, 3035, 5107, 5149, 5162, 5215
Thermistors 5180
Thermo-chemistry 3030, 3031
Thorium 3102–3104
Tillage 1046
Timothy 1053
Tin 3088, 4004, 5183
Tobacco 1069
Tomatoes 1004, 1031, 1069, 1074
Topology 8044
Toxicology 5220, 7035, 7103, 7105, 7108
Trace elements 1070
Tracers, radioactive 7084
Traffic studies 5017, 5018

- Transformers 5059, 5131, 5163, 5168, 5169
Transistors 5195, 8020, 8021
Transmission, power 5040, 5043–5045, 5051
Trees 4001, 4002, 6001–6011, 6016–6018, 6020–6028, 6030–6036
Trees (see also under name of genus of tree).
 breeding 6034
 ecology 6001, 6022
 germination 6031, 6032
 hardwoods 6001, 6002, 6016–6018, 6020, 6022, 6024, 6027,
 6028, 6032, 6034
 seeds 6031, 6032
 softwoods 6003, 6010, 6011, 6022, 6023, 6034, 6036
Trefoil, birdsfoot 1066
Triglycerides 3020
Trout,
 brook and lake 7012, 7013, 7018, 7032–7037, 7043, 7049–7051
 splake 7013, 7014, 7016
Trypsin 7088
Tubes,
 boiler 5057
 shock 8029
Tungsten 4004
Turbines, steam 5048
Turkeys 1087, 1088, 7003
Ultrasonics 5071, 5116
Ultra-violet radiation 5091
Underwater acoustics 8038
Uranium 3004, 3102, 3105, 3107, 5158, 5160

Vacuum drying 1081
Vacuum, ultra-high 8003
Vacuum packaging 7091
Vanadium 4004
Vapour, liquid equilibria 3051
Vegetable oil 3092
Vegetable products 1034
Vegetables (see also beans, beets, cucumbers, greenhouse vegetables,
 legumes, peas, peppers, potatoes, tomatoes, velvet leaf, etc.)
 1002, 1004, 1005, 1023, 1025, 1027, 1031, 1033, 1034, 1041,
 1043, 1068, 1069, 1073, 1074, 3092

- Velvet leaf 1073
Ventilation 2001
Vermiculite 3075
Vibration 5051
Vinyl acetate 3097
Viscometer 8006
Viscosity 3114, 8006
Voltage regulators 5166
- Walleyes 7011, 7026, 7040, 7060
Waste treatment, industrial 5081, 7098
Wastewater 5065
Water,
 alkalinity 7059
 balance 4002
 dissolved solids 7059
 hard and soft, effects on fish 7050
 high enthalpy 8029
 pollution 3032, 7067, 7072, 7076–7079
 pollution control 3037, 5078, 5080–5087, 7080, 7081, 7098
 resources 4013–4019, 5079, 5088
 treatment 5089–5092
 waterfowl 7065
 water heater 5114
 weather satellites 5205
Weed control 1043, 1069, 1073, 6019
Welding 5099, 5115, 5116, 5130
Wells, flowing 5079
Wheat 1058, 1059, 1067, 1078, 1079
Whey disposal 1019
Whitefish 7017, 7044, 7057
Wildlife,
 big game 7063
 birds, upland game and waterfowl 7065
 diseases 7062
 ecology 7062–7066
 fur bearers 7066
 population distribution 7063–7066
 predators 7064
Windbreaks 5153

Wines 1028
Wolves 7064
Wood adhesives 3100, 3101
Wood preservatives 3007–3009
Wood products (see also forest products) 3044, 6009
Wood pulps 3023, 3038, 3080, 3083, 3085, 5095, 5124, 6037,
7093, 8041
Wool 3036, 3111

X-ray analysis 3002
X-rays 3002, 5068

Yeasts 1021, 7098

Zinc 3063–3065, 3094, 4004, 5058, 5134–5141, 8051
Zinc,
 alloys 3063, 5134, 5139–5141
 coatings 5136
 extrusion 5137
Zirconate, calcium 3078
Zirconium 5128, 5130, 5157
Zirconium alloys 5128, 5130

AGRICULTURE

I

DEPARTMENT OF AGRICULTURE AND FOOD

Farm Economics, Cooperatives and Statistics Branch

AL-HASHIMI, M. — The apple industry in Ontario	1001
BLUM, H. — The Ontario greenhouse vegetable industry and its competitive position	1002
BLUM, H., AL-HASHIMI, M. — Marketing fresh strawberries in Ontario	1003
FISHER, G. A. — Processing tomato production in Essex, Kent and Norfolk Counties, production costs, returns and management practices	1004
Green and wax bean production costs and management practices in Ontario	1005
FISHER, G. A., DILLON, W. J., ABRAHAM, F. R., TOLTON, B. — Feed grain cost of production and management study in Ontario	1006
FISHER, G. A., DILLON, W. J. — An economic study of greenhouse flower production in Ontario	1007
GIBLON, R. E., CAMPBELL, S. — Prediction of Ontario hog supplies Price performance of the fresh fruit marketing board and central fruit exchange	1008 1009
HILL, R. G. F. — Farm labour in Ontario and trends in productivity ..	1010
HILL, R. G. F., BUTH, D., FISHER, G. A., STEPHENS, J. R. — The feasibility of establishing an economic study of the complete farm operations on selected Ontario farms	1011

AGRICULTURE

HILL, R. G. F., CAMPBELL, B. — The effect of crop rotations and systems of livestock on returns over operating costs in Ontario agriculture	1012
Trends in crop and livestock production, Ontario, 1951 to 1966	1013
Trends in Ontario agriculture by census years 1941 to 1966	1014
HILL, R. G. F., DILLON, W. J., FISHER, G. A., ABRAHAM, F., SABA, M. C., TOLTON, B. — Livestock feed production in Ontario, production costs, returns and management practices	1015
HILL, R. G. F., WALTER, H. — Production costs, returns and management practices: (1) Strawberries, (2) Raspberries, (3) Peaches, (4) Tart Cherries	1016
REDELMEIER, R., BARFOOT, L., MACDONALD, A. D. — Economics of dairy product substitutes in relation to dairy products	1017
REDELMEIER, R., CORNELL, MISS B. ¹ , BARFOOT, L. — 1958 Consumer survey on fluid milk purchases	1018
REDELMEIER, R., MACDONALD, A. D. — Economics of alternative methods of whey disposal at Southern Ontario cheese factories	1019
SORFLATEN, A. — The country grain elevator system in Ontario	1020

Horticultural Research Institute of Ontario

ADAMS, A. M. — Yeast (7 Projects)	1021
ALGOTSON, MIRIAM — Fruit chemistry, juices, concentrates, essences, and syrups (7 Projects)	1022
ANDERSEN, E. T., BRADT, O. A., CLINE, R. A., COLLIN, G. H., FLEMING, R. A., FORSTER, R. R., LOUGHTON, A., REISSMANN, H. J., RICKETSON, C. L., TEHRANI, G., WIEBE, J. — Studies in plant nutrition, soil management, and fertilizer use with fruit, vegetable and ornamental crops (21 Projects)	1023

¹ Ontario Food Council.

AGRICULTURE

ANDERSEN, E. T., BRADT, O. A., CLINE, R. A., COLLIN, G. H., FLEMING, R. A., FORSTER, R. R., HUTCHINSON, A., LOUGHTON, A., RICKETSON, C. L., TEHRANI, G., WIEBE, J. — Propagation, pruning, training, spacing and hardiness studies with horticultural crops (24 Projects)	1024
ANDERSEN, E. T., BRADT, O. A., COLLIN, G. H., HUTCHINSON, A., RICKETSON, C. L., TEHRANI, G. — Effect of growth-regulating chemicals on fruit and vegetable crops (7 Projects)	1025
ANDERSEN, E. T., CLINE, R. A., COLLIN, G. H., LOUGHTON, A., RICKETSON, C. L., WIEBE, J. — Effect of micro-climate and other environmental factors on growth and yield of selected horticultural crops (9 Projects)	1026
COOK, FRANCES I. — Fruit and vegetable products and storage (7 projects)	1027
CROWTHER, R. F. — Wines (10 projects)	1028
FULEKI, T. — Fruit Chemistry (3 projects)	1029
KERR, E. A., BRADT, O. A., HUTCHINSON, A., RICKETSON, C. L., TEHRANI, G. — Cultivar testing of fruits and breeding of apple, apricot, cherry (sweet and tart), grape, peach, pear, plum, small fruits (black currant, strawberry, raspberry) (16 projects)	1030
KERR, E. A., COLLIN, G. H., LOUGHTON, A., MUEHMER, J. K. — Cultivar testing of vegetables and breeding of cucumbers (greenhouse), peppers, potatoes, rhubarb, sweet corn, sweet potatoes, tomatoes (fresh market, greenhouse), processing (19 projects)	1031
KERR, E. A., FLEMING, R. A., FORSTER, R. R. — Cultivar testing of annual and perennial ornamental plants and breeding of chrysanthemum — hardy, clematis, gladiolus, holly, lilac, lily, rhododendron (8 projects)	1032

AGRICULTURE

TRUSCOTT, J. H. L. — Fruit and vegetable products and storage (6 projects)	1033
--	------

WARNER, JOYCE E. — Fruit and vegetable products (6 projects)	1034
--	------

Kemptville College of Agricultural Technology

BARR, G. R., PARKINSON, W. C. — Rations for growing and finishing dairy bulls for beef	1035
--	------

Effect of age of weaning and time of breeding on efficiency of weaner pig production	1036
--	------

BEACH, M. E. — Improving the keeping quality of coffee cream by the addition of potassium sorbate	1037
---	------

CLARK, J. H. — Automatic draft control for self-propelled wagons	1038
--	------

CLARK, J. H., OSBORNE, A. D., THORBURN, G. A. — Mechanized aid to tree fruit harvest	1039
--	------

CURTIS, J. D., O'TOOLE, J. J. — Evaluation of crop production techniques involving cereals, annual and perennial forages, corn, oil crops and white beans	1040
---	------

Evaluation of variety testing of annual and perennial forages, oil seeds, cereals, white beans, and corn	1041
--	------

GARDINER, J. S., MACDONALD, D. W. — Studies in soil management and fertilizer use with forages, corn, cereals, and soybeans	1042
---	------

HAMPSHIRE, F., CURTIS, J. D. — Weed control studies in field crops (corn, cereals, soybeans, and white beans)	1043
---	------

IRVINE, O. R. — Hydrogen sulphide producing bacteria in cheese and in cheese factory milk supplies	1044
--	------

IRVINE, O. R., BURNETT, K. A. — Methods of coloring fodder cheese to correct its objectionable pale color	1045
---	------

MACDONALD, D. W., GARDINER, J. S. — Tillage practices for corn	1046
--	------

AGRICULTURE

MORPHET, A. M., BARR, G. R., NEGM, H. — Studies on using dried shell corn, high moisture corn, corn cob meal and oats in growing diets with leghorn pullets	1047
Comparison between corn and corn cob meal in laying diets on egg production	1048
NEGM, H., BARR, G. R., MORPHET, A. M. — The physical effect of pellets and ground pellets with a high feed in fibre, (e.g. corn cob meal) on egg production	1049
Various levels of protein and their effect on sexual maturity in leghorn pullets	1050
Trials with raw soybeans in poultry diets	1051

Milk Commission

BAIN, J., REDELMEIER, R., BARFOOT, L., JOHNSTON, A., JARDINE, R. — 1968 study of the Ontario cheese industry	1052
--	------

New Liskeard College of Agricultural Technology

SKEPASTS, A. V. — The effect of rates and time of application of nitrogen fertilizer on dry matter yields of timothy, reed canary and crested wheat grass	1053
Effect of various rates of P and K on dry matter yield, stand and botanical composition of a certain legume grass mixture	1054
Effect of various rates of nitrogen and phosphorus on barley yield and other agronomic characteristics	1055
Yield responses of certain barley varieties to various levels of nitrogen fertilizer	1056
Evaluation and comparison of seed rape varieties for oil production ¹	1057

¹ Co-operative project (federal and provincial governments).

AGRICULTURE

Comparative adaption and evaluation of late generations of oat, wheat and barley strains ¹	1058
Evaluation and comparison of spring wheat strains and varieties ¹	1059
Evaluation and comparison of field pea varieties ¹	1060
Comparative adaptation of licensed oat and barley ¹	1061
Evaluation of sunflower and rape seed varieties and strains for oil production ²	1062
Evaluation and comparison of brome grass and reed canary varie- ties for dry matter production under hay and pasture manage- ment ²	1063
The effect of date of seeding on grain and straw yield of oats and barley	1064
The effect of different seeding rates, levels of nitrogen and dates of seeding on barley yields and other agronomic characteris- tics	1065
The evaluation and comparison of birdsfoot trefoil and alfalfa strains and varieties for dry matter production under hay man- agement ²	1066

Ridgetown College of Agricultural Technology

BALDWIN, C. S., JOHNSTON, R. W., STEVENSON, C. K. — Rotation, population, residual effects, growth regulators, and past man- agement studies on corn, soybeans, fall wheat, and spring barley (5 projects)	1067
BOLWYN, B., BROWN, R. H. — Insect and disease control studies in field corn and beans	1068
BROWN, R. H., MINDREBOE, K. J. — Weed control studies in field corn, processing tomatoes, red beets, strawberries, processing peas and burley tobacco	1069

¹ With the Ontario Cereal Committee.

² With the Ontario Forage Committee.

AGRICULTURE

JOHNSTON, R. W., BALDWIN, C. S., STEVENSON, C. K. — Studies with trace elements and secondary nutrients on the growth and yield of field crops (7 projects)	1070
MCCLAREN, A. D., THIPPHAWONG, B. — The evaluation of lines, strains and varieties of forage crops, grain corn, field beans and soybeans	1071
Evaluation and comparison of cultural practises and management of field corn, soybeans, field beans and forage crops	1072
MINDREBOE, K. J., BROWN, R. H. — Weed control studies in soy, white, lima and kidney beans, cereals, legumes, potatoes, cucumbers and velvet leaf	1073
MUEHMER, J. — Cultural studies in processing crops (tomatoes, cucumbers, beans)	1074
SOJAK, M., WINFIELD, R. G. — Evaluation of equipment to minimize tillage operations for corn	1075
Storing high moisture corn in a butyl silo	1076
STEVENSON, C. K., BALDWIN, C. S., JOHNSTON, R. W. — Rate, time and method of application of nitrogen, phosphorus, and potassium on the growth and yield of corn, soybeans and spring barley (17 Projects)	1077
THIPPHAWONG, B., MCCLAREN, A. D. — Evaluation of lines, strains, and varieties of winter barley, winter wheat, spring barley, oats and rice	1078
Evaluation of cultural practises involving seed sizes and seeding rates of oats and barley and winter wheat	1079
WINFIELD, R. G. — Dryeration for grain corn	1080
Vacuum drying of grain corn	1081
WINFIELD, R. G., BEATTIE, D. — Harvesting and storing corn stover silage	1082

AGRICULTURE

Ontario Research Foundation Department of Physiography

CHAPMAN, L. J. — Tests of early maturing rice	1083
---	------

Atomic Energy of Canada Limited

MACQUEEN, K. F., FERGUSON, W. E., LEES, D. H. — Applications of gamma irradiation as a commercial preservation method of fish, poultry, grain, mushrooms and strawberries ¹	1084
Applications of gamma irradiation for control of salmonella organisms in poultry, egg products and animal feeds ¹	1085
Application of gamma irradiation to stimulate plant growth ¹	1086

Maple Leaf Mills Limited

MORRISON, W. D., TREMERE, A. W. — To test effect of diet on body composition of turkeys	1087
To compare energy levels of diets for Western Canada, to establish lysine requirements for turkey toms	1088
To investigate response of cage layers to increased energy and/or protein plus amino acids	1089
TREMERE, A. W., MORRISON, W. D. — To test the use of a fat product in dairy feeds and its effect on milk production and butterfat test	1090

¹ Projects in cooperation with Canadian Universities and research organizations.

ARCHITECTURE

II

**Department of Agriculture and Food
Extension Branch**

CLAYTON, R. E., WINFIELD, R. G., LUCKHAM, D. G. — Porous ceilings as ventilation inlets¹ 2001

**Department of Agriculture and Food
Horticultural Research Institute of Ontario**

FULEKI, T. — Design of chemistry laboratories 2002

**Department of Education
School Planning and Building Research Section**

ANDERSEN, A. F., PAIN, (MRS.) MARIA — Instructional materials centres: 1) for 15 teachers
2) for 150 teachers: Research and Planning 2003

Classrooms for emotionally disturbed children (elementary)
(Research and Planning) 2004

ORLOWSKI, S. T. — A study of computer simulation analysis as applied to colleges of Applied Arts and Technology 2005

Master Planning for colleges of applied Arts and Technology² 2006

Spatial planning for colleges² 2007

ORLOWSKI, S. T., ANDERSEN, A. F., PAIN, (MRS.) MARIA — Industrial arts rooms for Primary and Secondary schools 2008

ORLOWSKI, S. T., ANDERSEN, A. F., ABUL-KHAIR, A. M. — Portable classroom 2009

¹ Ridgetown College of Agricultural Technology, Ridgetown.

² With Leman-Sullivan, Architects and Planners.

ARCHITECTURE

ORLOWSKI, S. T., ANDERSEN, A. F. — Library resources centres for elementary schools brochure	2010
Technical and occupational shops brochure	2011
Sciences Laboratories for Secondary Schools brochure	2012
ORLOWSKI, S. T., LEMIEUX, MARILYN — Libraries for Colleges of Applied Arts and Technology	2013
ORLOWSKI, S. T., PENG, J. — Educational T.V. for Colleges of Applied Arts and Technology	2014
Student centres for Colleges of Applied Arts and Technology	2015
STIRLING, R. J., PLAXTON, KATHARINE — 'Community use of schools' — survey of administrative legislative and architectural aspects	2016

CHEMISTRY

III

Department of Mines, Laboratory Branch

MODDLE, D. A., HICKS, W. D., LAAKSO, R. — Investigation of causes of colour in minerals	3001
UEMER, A. — Testing KAP crystal for the determination of Na in rocks by the x-ray spectrograph	3002
IJAN, P. N. — A new combustion titration method for determining sulphur in air pollution candles	3003
Modification of fluorimetric method of uranium analysis	3004
Adaption of direct photometric determination method (U.T. Hill, Amal. Chem., 28, 1956) for aluminum rocks	3005

Hydro-Electric Power Commission of Ontario Research Division

UGGITT, J. W. — Study of Hydroxyethylcellulose — thickened herbi- cide sprays for aircraft application	3006
UGGITT, J. W., PARKER, G. L. — Evaluation of wood preservatives by stake plot tests	3007
Study of creosote preservative retentions in butt-treated western cedar wood poles after long service	3008
UGGITT, J. W., TAKAHASHI, S. — Gas chromatographic procedure for quantitative analysis of pentachlorophenol — petroleum wood preservative solutions	3009

Ontario Research Foundation Department of Materials Chemistry

KUNTZE, R. A., BROWN, E. C. — Study of the adhesive properties of asphalt and the changes in the adhesion between asphalt and mineral surfaces in the presence of water and aqueous solutions ..	3010
--	------

CHEMISTRY

KUNTZE, R. A., HAWKINS, P. — The role of sulphates during the early stages of the hydration of Portland cement with particular reference to false set	301
KUNTZE, R. A., MARTIN, R. J., ADAMI, A. — The physical chemistry of gypsum and its dehydration products	301
MURTHY, M. K., CALEY, R. H. — Thick film technology — development of active and passive electronic components	301
Germania Research — Development of new GeO ₂ based glasses ..	301
MURTHY, M. K., RUMMERY, T. E. — Glass — ceramics — development of novel materials based on silica polymorphs	301
Phosphate Research — Adsorption of polyphosphates on clay minerals	301

Ontario Research Foundation Department of Organic Chemistry

DAS, B. S. — Lignin Chemistry	301
DEAN, F. H. — Cyclopentadienide chemistry	3018
KIRBY, MISS E. M. — Characterization of fatty acids by infrared spectrophotometry	3019
LEMON, H. W. — Characterization of triglycerides	3020
LOMAS, H., EBINGER, A. — The relationship of chemical structure and surface activity of organic compounds	3021
LOMAS, H., GOLOMB, A., LEMON, H. W. — Characterization of insect attractants	3022
MATOLCSY, G. — Paper-making characteristics of balsam fir	3023
REID, S. G. — Absorbency of paper	3024
REYNOLDS, L. M. — Pesticide analysis methodology	3025

CHEMISTRY

SOWA, W. — Carbohydrate chemistry	3026
THOMAS, G. H. S. — Nuclear magnetic resonance studies in carbohydrates	3027

Ontario Research Foundation Department of Physical Chemistry

HOPTON, F. J., BEAL, S. — An NMR study of fluorinated epoxide-acyl halide rearrangements	3028
ONES, M. H., WONG, E. W. — Synthesis of fluorinated epoxides and related polymers	3029
MCAFIE, H. G. — Establishment of temperature standards for differential thermal analysis as part of a programme on thermal analysis standards coordinated through the International Conference on Thermal Analysis	3030
MCAFIE, H. G., SOLTYS, J. — Production of high porosity catalysts for specific applications through high-temperature decomposition and interaction	3031
EFTON, V. B., GOLOMB, A. — Development of new polymer systems for preparation of reverse osmosis membranes	3032
EFTON, V. B., SETO, P. — Extraction of metal chlorides from ore concentrates of refractory metals	3033
EFTON, V. B., TAYLOR, J. C. — Development and construction of automatic analyser for monitoring gaseous fluoride air pollutants	3034

Ontario Research Foundation Department of Textiles

TAPLES, M. L., CAMPBELL, H. J. — Chemical modification of cellulosic fibres to improve durable press (wash-wear), flame resistance and other properties of fabrics that are important to the consumer	3035
---	------

CHEMISTRY

- STAPLES, M. L., WILLIAMS, M. J. — Structural modification of protein fibres to improve properties in which these fibres are deficient with particular reference to production of "Easy-Care" wool garments and bleaching heavily pigmented hair 303

Ontario Water Resources Commission Division of Laboratories

- NEIL, J. H., SIMPSON, C. E., KING, D. E. C. — Application of Technicon Auto Analyser equipment to the automatic chemical analysis of water, sewage and industrial wastes 303

Abitibi Paper Company

- RIEM, R. H. — Identification of colour progenitors in high-yield pulps 303
YAN, M. M., BALDWIN, S. H. — Medium density fibreboard 303

Abrex Specialty Coatings Limited

- BARTON, H. J. — Investigation of organic coatings suitable for application by electrodeposition 304
YOUNG, G. — The application of organic coatings to coil using electrodeposition 304

Aerofall Mills Limited

- TURNER, R. R., POWELL, C., GOODFELLOW, H. D. — Physical and chemical properties of finely divided solids in air 304

Atomic Energy of Canada Limited

- DASGUPTA, S., DAVIES, A. G. — The application of gamma irradiation to produce graft copolymer combinations with unique properties for use as textiles 304
The application of gamma irradiation to produce wood-polymer combinations for industrial use 304

CHEMISTRY

DOWNS, W. E., WISE, M. E., COURTEMANCHE, R. — The application of neutrons from the Antimony-124-Beryllium reaction to the continuous analysis of elements in industrial solutions and slurries with particular reference to the mining and metals industries	3045
--	------

British American Research and Development Company

CASHMORE, K. — Research into the properties, formulations, and applications of fuels, greases, asphalts, and lubricating oils	3046
CASHMORE, K., BAYS, N. — Studies of hydrogenation processes applied to petroleum	3047
SMELTZER, J. E., FREURE, R. J. — Development of a Canadian source of rubber extender and process oils	3048
ZAKAIB, D. D., ST. GEORGE, B. C. — Research into the composition of petroleum and petrochemicals using modern analytical chemistry techniques	3049
ZAKAIB, D. D., SMELTZER, J. E. — Research in petrochemicals and specialty products	3050
ZAKAIB, D. D., SPIRO, J. G. — Studies of vapour-liquid equilibria of various multi-phase systems	3051

Canada Packers Limited

APPLETON, J. W. — Continuous processing of wieners	3052
BURKE, T. — Factors affecting beef tenderness	3053
ESLINGER, M. J. — Meat raw materials for sausage formulations	3054
JANKUS, E. E. — Evaluation of binders in sausage products	3055
NORDIN, H. R., DUTKEWYCH, E. — New curing methods	3056
NORDIN, H. R., WEBB, G. G. — Thermal processing of canned meat products	3057

CHEMISTRY

TEASDALE, B. F., MERTENS, W. G., MAG, T. — Utilization of fats and oils in the manufacture of margarine, shortening, salad oil and frying fats	3058
WAINEWRIGHT, F., ESLINGER, M. J. — Gelatine manufacturing processes	3059

Chemical Projects Limited

POGORSKI, L. A., CHAN, C., WILLIAMS, P., GALDI, G., MCRAE, G. — Isotope ratio program: research and development work leading to the development of faster and more precise methods for measurement of isotopic ratios of H ² /H ¹ , C ¹³ /C ¹² , N ¹⁵ /N ¹⁴ , O ¹⁸ /O ¹⁶	3060
POGORSKI, L. A., REIMER, E., WILLIAMS, P., CHAN, C., HAZELDEN, L., WALKER, W., TRENT, R. — Air pollution program: research and development work leading to the development of more precise methods of surveying and determining air pollution	3061
POGORSKI, L. A., ROSS, L., REIMER, E., CHAN, C., WILLIAMS, P., WALKER, W. — Stable isotopes program: research and development work leading to the development of methods applicable for separation of heavy and light hydrogen isotopes, of carbon-13, oxygen-18, and nitrogen-15 isotopes and preparation of stable isotope labelled compounds	3062

Cominco Limited Product Research Centre, Sheridan Park, Ontario

GUTTMAN, H. — Corrosion	3063
WRIGHT, M. M. — Protective coatings for zinc	3064
Zinc electrochemistry	3065
WRIGHT, M. M., RAJAN, J. B. — Lead-acid battery plates curing studies	3066

CHEMISTRY

Dunlop Research Centre

ADAMEK, S., MACKILLOP, D. A. — Polymerization and copolymerization of cyclic sulphides	3067
BOYD, S. — Specific studies in the area of polymerization and copolymerization	3068
LAUTENSCHLAEGER, F. K., SCHWARTZ, N. V. — Synthesis and reactions of sulphur-containing compounds	3069
SUN, K. Y. L., ADAMEK, S. — Specialized studies in the field of composites	3070

Electric Reduction Company of Canada, Limited

MCGILVERY, J. D. — The development of a new generation process for chlorine dioxide in which sodium sulphate is obtained as a usable by-product	3071
Investigations on a process for the production of aluminum fluoride from bauxite and fluosilicic acid	3072
Investigations on electrode materials for use in the electrolysis of chlorides to form chlorates	3073
Removal of H ₂ O from H ₂ O/D ₂ O mixtures by electrolysis	3074

Fiberglas Canada Limited

MAINE, F. W., PETERS, K., SZOLARY, L. — Exfoliated products	3075
MAINE, F. W., RAO, R. P., CHAN, R. K. — Inorganic binders	3076
MAINE, F. W., SHERWOOD, K. J., TRUKSA, L. K., DEVZEMAN, H. — Non-phenolic binders	3077
MAINE, F. W., SHUTT, T. C. — Calcium zirconate	3078
Mullite	3079

International Cellulose Research Limited

GARDNER, P. E., CHANG, M. Y. — Structure and solution properties of hemicelluloses from wood pulps	3080
--	------

CHEMISTRY

GARDNER, P. E., BROPHY, (MISS) D. — Analysis of sugars by gas chromatography	3081
GUPTA, V. N. — Reactions of peroxy compounds with lignin	3082
Brightness and colour of groundwood and high yield pulp	3083
LOVE, J. A. — Cellulose-polymer combinations	3084
TYMINSKI, A. — Colour precursors in wood and high yield pulp	3085

Lever Brothers Limited

WINTHROP, S. O. — Investigations in the fields of oils, fats, soaps, and detergents	3086
---	------

Mallory Battery Company of Canada Limited

KELLY, F. J., PRZYBYLA, F. — Low temperature characteristics of alkaline primary (electrochemical) systems	3087
--	------

M and T Products of Canada Ltd.

GOULDEN, P. D., ZOMA, C. T. — Solubilities of sodium/potassium stannate in sodium/potassium hydroxide solutions	3088
---	------

Maple Leaf Mills Limited Research Division

McCABE, P., DYCK, P. J. — Development of new baking processes	3089
Development of convenience foods and food mixes	3090
McCABE, P., GAMULA, P. — Studies in pet food processing and development of new pet foods	3091
McGIRR, D. J. — Studies in vegetable oil processing and development of new uses for vegetable oils	3092
Development of water thinned paint resins	3093

CHEMISTRY

Northern Electric Company Limited

- SZAPLONCZAY, (MRS.) A. M. — Coprecipitation studies of manganese-zinc ferrite 3094

Procter and Gamble Company of Canada Limited

- POLLOCK, F. E., DIXON, J. E., O'CONNOR, M. W., CARROTHERS, D. F.
— Research in soaps and detergents 3095

- POLLOCK, F. E., QUAMMEN, W. A., CHALMERS, D. F., HEDGINS, J. F.
— Research in edible fats 3096

Reichhold Chemicals (Canada) Limited

- CAMA, V. — Emulsion polymerization: this is a thorough study of the emulsion of polymerization of vinyl acetate and vinyl acetate copolymers, styrene and styrene copolymers. This work is being approached from both a colloidal and polymer standpoint and is designed to give complete control over the properties of the latex and to correlate chemical properties with the final physical and mechanical properties of the film 3097

- KAMBANIS, S. — Scientific technique evaluation program: This is a major program to apply modern scientific tools to research and development in polymer chemistry 3098

- MIR, M. K., KUCHARSKA, H. — Phenol-formaldehyde resins and moulding compounds: this program is designed to elucidate reaction mechanisms and kinetics, structures, molecular weight, etc. in phenol-formaldehyde novolak systems and to research and develop new and improved phenolic moulding compounds 3099

- VASISHTH, R. C. — Adhesives for the forest products industry: this research program includes a very basic approach to the elucidation of phenol-formaldehyde and resole reaction mechanisms, structures, molecular weight, etc., and is designed to correlate structure and configuration with final properties of the polymer when in use 3100

- Durability of Wood Surfaces: this program is designed to research and develop non-conventional adhesives and coatings for wood surfaces. This program includes plastic overlays for wood, protective coatings, etc. 3101

CHEMISTRY

Rio Algom Mines Limited Nuclear Products Department

BARNES, E., GOODE, J. R., KESHVANI, K. J., LEWIS, B. A. — Recovery of thorium, rare earths and other values from spent uranium liquors	3102
BARNES, E., GOODE, J. R., LEWIS, B. A. — Preparative processes for the production of refined solid thorium compounds particularly oxide and nitrate	3103
BARNES, E., GOODE, J. R., LEWIS, B. A. — Processes for the production of refined thorium solutions, with special reference to the use of solvent extraction techniques	3104
FISHER, J. W., BOULTON, J. T. — Acid leaching of uranium ores	3105
FISHER, J. W., MILLER, S. W. R. — Development of instrumental methods of analysis	3106
FISHER, J. W., SIMPSON, R. P. — Applicability of baterial leaching techniques to the recovery of uranium, and copper from low grade ores and concentrates	3107
Chemical smelting of copper — production of copper from flotation concentrates	3108
FISHER, J. W., VIVYURKA, A. J. — Production of ammonium diurate by ion exchange-solvent extraction methods	3109

Sprague Electric of Canada Limited

BURGER, F. J., WU, J. C. — Electrolyte systems for electrolytic capacitors	3110
--	------

Thompson Research Associates Limited

CRUICKSHANK, N. H., MAINS, F. — Investigations into new methods of rendering wool anti-felting	3111
CRUICKSHANK, N. H., MCLEOD, G. — Investigations into increasing life of cotton particularly when used as paper dryer felts and mine filter fabrics	3112

CHEMISTRY

Union Carbide Canada Limited

BATA, G. L., HAZELL, J. E. — High pressure Polymerization kinetics	3113
BATA, G. L., HAZELL, J. E., DUNCAN, P. M. — Structure-property relationships of linear and branched polyethylene	3114
Transition metal complex catalysts in ionic polymerization	3115
BATA, G. L., HAZELL, J. E., DUNCAN, P. M., KIMBALL, W. J. — Study of diffusion controlled phenomena under fluidization conditions	3116
BATA, G. L., HAZELL, J. E., PRINCE, L. A. — Detailed analysis of complex hydrocarbon systems using gas chromatographic techniques	3117
BATA, G. L., SINGH, K. P. — Free radical copolymerization of non-vinyl type monomers	3118
Interfacial phenomena in partially miscible liquids	3119
BATA, G. L., SINGH, K. P., ANDREJCHYSHYN, W. M. — Reactions of oxiranes	3120
BATA, G. L., SINGH, K. P., HAKKA, L. E. — Nucleophilic reactions of acidic gases	3121
BATA, G. L., SINGH, K. P., ZALKOWITZ, R. S., CLARKE, A. R. — Structure of heat-stable polymers	3122

EARTH SCIENCES

IV

**Department of Lands and Forests
Research Branch, Forestry**

HILLS, G. A., BOISSONNEAU, A. N., BURGER, D., CROMBIE, G., MCNEELY, H. A., WILLIAMS, J. R. M. — Studies of land- vegetation relationships, land classification by physiographic criteria, mapping patterns of land using air photos	4001
PIERPOINT, G. — Water balance of site districts in Ontario	4002
HADDON, J. A., JACKSON, B., DAWSON, F., RALPH, P., ROBESON, D. — Continuing research into cartographic graphics, with special emphasis on photo-mechanical and systems solutions	4003

**Department of Mines
Geological Branch**

PYE, E. G. — Studies for the Ontario Department of Mines' publications: Industrial Minerals Report, Industrial Minerals Circular, Industrial Mineral Resources Series and Mineral Resources Circular:

A Survey of Stone Resources along the Niagara Escarpment
Ceramic Industry in Ontario

Copper, Nickel, Lead, and Zinc Deposits of Ontario (revision of
Metals Resources Circular #2, 1957)

Gold Deposits of Ontario

Industrial Mineral Resources of the Bolton Area

Industrial Mineral Resources of the Hamilton Area

Industrial Mineral Resources of Southern Ontario

Iron Deposits of Ontario

Mineral Fillers in Ontario

Miscellaneous Metal Deposits of Ontario (chromium, columbium,
tungsten, calcium, magnesium, platinum group, cadmium,
selenium, tellurium, vanadium, tin, manganese, bismuth)

Peat Moss in Ontario (2 projects)

EARTH SCIENCES

Phlogopite Mica Deposits of Ontario	
Sand and Gravel Deposits in Southern Ontario	
Silver and Cobalt Deposits of Ontario	
Some Aspects of Environmental Geology	
The Portland Cement Industry in Ontario	4004
PYE, E.G. — Compilation sheets prepared by the Ontario Department of Mines in 1968:	
Favourable Lake-Poplar Hill Compilation Sheet	
Fort Hope-Lansdowne House Compilation Sheet	
Lingman Lake-Sandy Lake Compilation Sheet	
Manitouwadge-Wawa Compilation Sheet	
Sachigo River Compilation Sheet	
Sudbury-Cobalt Compilation Sheet	4005
PYE, E. G. — Geological Field investigations of areas in Ontario by geological survey parties of the Ontario Department of Mines in 1968:	
Adams and Eldorado Townships, District of Timiskaming	
Dorothea, Irwin, and Sandra Townships, District of Thunder Bay	
Atikwa Lake Area, District of Kenora	
Batchewana Area, District of Algoma	
Bay of Island-McGregor Bay Area, District of Sudbury	
Beemer, English and Zavitz Townships, District of Sudbury	
Bernhardt-Morrisette Townships, District of Timiskaming	
Black Sturgeon Area, District of Thunder Bay	
Bourkes Area, District of Timiskaming	
Bruce Lake Area, District of Kenora, Patricia portion	
Burwash Area, Nipissing and Sudbury Districts	
Cloud Bay Area, District of Thunder Bay	
Cutler Area	
Eby Township, District of Timiskaming	
Eby and Otto Townships, District of Timiskaming	
Fallon and Fasken Townships, District of Timiskaming	
Finlayson Lake Area, District of Rainy River	
Fort Hope	
Fredart-Whitemud Lakes Area, District of Kenora, Patricia Portion	

EARTH SCIENCES

Glasgow-Rennie Area, Districts of Algoma and Sudbury	
Gowganda Area, District of Timiskaming	
Granitehill Lake, District of Thunder Bay	
Grigg and Stobie Townships, District of Sudbury	
Lake Nipissing Area	
Langmuir and Blackstock Townships, District of Timiskaming	
Leith-Corkhill, Area, District of Timiskaming	
Lingman Lake, District of Kenora, Patricia Portion	
Louise-Eden Area, District of Sudbury	
Malba and Bisley Townships, District of Timiskaming	
Manitouwadge Area, District of Thunder Bay (ore deposits)	
Massey Area, Districts of Algoma and Sudbury	
Moher, Semple, and Hutt Townships, District of Sudbury	
Moss Lake Area, District of Thunder Bay	
Mulcahy Township (North Half) District of Kenora, Patricia Portion	
Nighthawk Lake Area, District of Cochrane	
Northeast Timagami Area, District of Nipissing	
North Shoal Lake, District of Kenora	
Obonga-Leigh Lakes Area, District of Thunder Bay	
Pardee and Devon Townships and the Stewart Location, District of Thunder Bay	
Pukaskwa, Districts of Algoma and Thunder Bay	
Rainy Lake Area, District of Rainy River	
Rawhide Lake Area, District of Algoma	
Reeves-Kenogaming Area, District of Sudbury	
Roberts-Fraleck Area, District of Sudbury	
Setting Net Lake Area, District of Kenora, Patricia Portion	
Shining Tree Lake Area, District of Sudbury	
South Lorrain Township, District of Timiskaming	
Tashota-Onaman Area, District of Thunder Bay	
Tomiko Area, District of Timiskaming	
Trout Lakes Area, District of Kenora, Patricia Portion	
Tustin-Bridges Area, District of Kenora	
Vermilion-Abram Lakes Area, District of Kenora	
Walters and Leduc Townships, District of Thunder Bay	
Watcomb-Clarkdon Area, District of Kenora	4006

EARTH SCIENCES

PYE, E. G. — Miscellaneous projects undertaken by the Geological Branch of the Ontario Department of Mines in 1968:	
A helicopter-supported reconnaissance survey of the Pamour Area, District of Cochrane	
A magnetic survey of Robb and Jamieson Townships, District of Cochrane	
Automatic data processing of Ontario's mineral deposits	
Bibliography (geographical and author index) of Ontario geology	
Geochemical stream sampling survey, Pukaskwa Region, District of Thunder Bay	
Kaolin, fireclay, silica sand, and lignite deposits of the Moose River Basin, Ontario	
Pleistocene geology of the Brantford Area	4007
PYE, E. G. — Special maps prepared by the Geological Branch of the Ontario Department of Mines in 1968:	
Index maps of aeromagnetic sheets by Lockwood Survey Corporation, 1966, 1967	
Revision of Ontario Department of Mines index maps	
Rockhounds map	4008

Department of Mines Laboratory Branch

LAAKSO, R., CAMPBELL, F., HICKS, W., TUEMER, A., VIJAN, P. —	
Composition and properties of Ontario rocks	4009
Composition and properties of Ontario shales and clays	4010
MODDLE, D. A., WALSH, J. B. — Neutron activation analysis of gold in rocks in the parts per billion range ¹	4011

Ontario Research Foundation Department of Physiography

CHAPMAN, L. J. — Physiography of Southern Ontario	4012
---	------

¹ Project is a collaboration along with the Geological Survey of Canada and the Atomic Energy Commission.

EARTH SCIENCES

Ontario Water Resources Commission Division of Water Resources

HORE, R. C., FLEISCHER, F., BAROUCH, M., SWEETMAN, A. — Representative basin studies under the IHD program, all aspects of water balance are being studied in five drainage basins representative of different geomorphologic regions in southern Ontario	4013
HORE, R. C., RENZONI, C. — Electrical resistivity studies in the east and middle Oakville Creeks basin. Electrical studies are being carried out to trace sand and gravel aquifers above the bedrock	4014
SINGH, B. A., MELLARY, A. A. — Groundwater assessment under the IHD program, test-drilling and test-pumping programs to determine the hydraulic characteristics of various aquifers and to help assess the ground-water resources potential in Ontario	4015
YAKUTCHIK, T. J., PIKULA, R., WILKINS, R., WANG, K. T. — Water resources survey of the Albany River drainage basin in conjunction with a water resources survey of northern Ontario	4016
YAKUTCHIK, T. J., SIBUL, U., CHOO-YING, A., KENDRICK, G. — Water resources survey of the Nottawasaga River drainage basin	4017
YAKUTCHIK, T. J., SIBUL, U., FLEISCHER, F., MORRISON, W. D. — Water resources survey of the Big Otter Creek drainage basin	4018
YAKUTCHIK, T. J., SINGH, B. A., SIBUL, U. — Water resources survey of the Big Creek drainage basin	4019

Barringer Research Limited

MACDOWALL, J., COX, W., MCNEILL, J. D., PAUL, M., MILLAN, M. — Electromagnetic mapping instrumentation and techniques	4020
---	------

Chemical Projects Limited

POGORSKI, L. A., CHAN, C., GALDI, G., REIMER, E., WILLIAMS, P., MCRAE, G. — Geochemical program and development of better geochemical methods of exploration for petroleum and natural gas	4021
--	------

EARTH SCIENCES

Huntec Limited

GRANT, F. S., SPECTOR, A. — Application of digital computers to analysis of gravity and aeromagnetic data: development of matched filters, methods of depth analysis and downward continuation	4022
HUTCHINS, R., REDDERING, H. — Electro-magnetic induction prospecting systems. Development of an optimum adaptive filter and measuring system for very weak signals in the presence of noise. (Signal level — 180 decibels below the noise level) ¹	4023
HUTCHINS, R., REDDERING, H. — Induced polarization prospecting system — development of a high sensitivity light weight high power system for prospecting using the induced polarization method ¹	4024

¹ With the Department of Industry under the PAIT program.

ENGINEERING

V

**Department of the Attorney General
Office of the Fire Marshal**

BRYAN, D. M. — Determination of fire hazard characteristics of materials	5001
--	------

Materials and Testing Division

CASEY, J. — The reproducibility of tests on asphalt cements and liquid asphalts — an interlaboratory programme	5002
CHOJNACKI, B. — Movement of joints in bridges	5003
Field performance of preformed neoprene bridge joint seals	5004
CORKILL, J. T. — Bridge deck waterproofing systems	5005
CORKILL, J. T., LYNCH, D. — Using 300 - 400 penetration grade asphalt cements in Northern Ontario — construction and performance	5006
CORKILL, J. T., LYNCH, D., BROWN, C. — Investigating longitudinal bituminous paving jointing techniques	5007
Variations in gradations and in asphalt content of bituminous mixes obtained from truck samples and pavement samples	5008
FIELD, F. — Winter patching mixes — a specification for asphalt emulsion mixes	5009
Predicting V.M.A. values from aggregate gradations	5010
FIELD, F., PHANG, W., CORKILL, J. T. — Stripping in asphaltic concrete mixes: field evaluation of additives	5011
RYELL, J., CHOJNACKI, B. — Concrete curing and sealing compounds	5012
The air void system near the surface of concrete bridge decks	5013
SLOAN, G., KONIUSZY, (MRS.) Z. — The polished-stone values of typical Ontario coarse aggregate	5014

ENGINEERING

WILSON, P., CHIU, M. — Measuring the smoothness of concrete bridge decks	5015
WILSON, P., RYELL, J., TIEDE, H. — Quality control of high strength concrete	5016

Department of Highways Planning Branch

ARGUE, A. — Operation of a "Two Lane Left Turn" at signalized intersections	5017
Traffic signal warrants at one lane bailey bridges	5018

Department of Highways Research Branch

ARMSTRONG, M. D., SMITH, P. — Full-scale impact testing of guide rail systems, sign-supports, and light standards	5019
CHONG, G., STOTT, G. M. — Evaluation of municipal roads and streets	5020
FROMM, H. J. — Chromatographic analysis of paving asphalts	5021
FROMM, H. J., PHANG, W. — Transverse cracking of flexible pavement	5022
HARTELINK, M. D. — Determination of left-turn storage lane warrants	5023
Pilot study of origin-destination sampling procedures	5024
The estimation of average annual daily traffic and design hourly volumes from the results of short surveys	5025
Additional passing lanes on two lane highways	5026
HARTELINK, M. D., JAEGAR, F., DE VALENCE, P. — Multipath traffic assignment program development	5027
PHANG, W., STOTT, G. M. — A full-scale bases experiment of highway 10, Brampton	5028
SCHONFELD, R. — Skid resistance of Ontario roads	5029
Quality control of embankments and granular bases	5030

ENGINEERING

SMITH, P., CHOJNACKI, B., RYELL, J. — Alkali-carbonate aggregate reactivity in Ontario	5031
SMITH, P., TIEDE, H. — Accelerated concrete strength tests: a field evaluation	5032
Concrete pavement performance study	5033
TAMBERG, K. G. — Composite construction in bridges	5034
TAMBERG, K. G., JUNG, F. W. — Bridge classification study	5035
TAMBERG, K. G., JUNG, F. W., CSAGOLY, P. — Development of vehicle load parameters for use in bridge design and evaluation	5036

Department of Mines Geological Branch

Office of the Comptroller: Office of the Mine Assessor

CAVANAGH, R. L. — To determine the feasibility of using Ontario peat moss as an iron pellet binder to replace bentonite which is presently being imported by certain Ontario iron mines from the United States ¹	5037
---	------

Department of Mines Mines Inspection Branch

BARRETT, C. M. — To develop an Electro Magnetic Cable Tester capable of testing lock coil ropes, which are of different construction than standard wire cables ²	5038
---	------

Department of Mines Office of the Sulphur Fumes Arbitrator

DREISINGER, B. R., McGOVERN, P. C. — The correlation of various levels of sulphur dioxide pollution from mining operations with injury to surrounding vegetation. From this information, air quality standards for sulphur dioxide are being determined	5039
---	------

¹ Research being carried out for the Department of Mines by the Ontario Research foundation.

² In cooperation with the Ontario Mining Association.

ENGINEERING

Hydro-Electric Power Commission of Ontario
Research Division

BROWN, T. A. — Study of creep of acsr overhead conductor	5040
CAMERON, A. W. W., ERVEN, C. C. — Development, and interrupting capability testing, of a high-speed synchronized operating mechanism to increase the rating of vacuum circuit-breakers	5041
CAMERON, A. W. W., KURTZ, M. — Studies of application of synthetic electric insulations	5042
Development of free-fluid insulation systems for underground transmission circuits	5043
Evaluation of cross-linked polyethylene cables for service at transmission voltages	5044
CAMERON, A. W. W., LINCK, H. — Development of computer methods for prediction of lightning performance of transmission lines	5045
Development of composite air-gaps for improved surge protection of high-voltage stations	5046
Development of surge recorders for unattended stations	5047
HARRISON, D., FERRIE, J. S. — Study of the long-term depletion of rust inhibitors from steam turbine oils	5048
Study of the shear stability of hydraulic and lubricating oils containing viscosity inhibitors, under high shear conditions	5049
HARRISON, D., FERRIE, J. S., STROM, R. — Study of the physical and chemical properties of cable oils and their mutual compatibilities	5050
HOGG, A. D., EDWARDS, A. T. — Investigation of nature and control of vibration and galloping of overhead power-transmission conductors	5051
JONES, D. E., WHATMOUGH, R. — Study of microwave system reliability in service	5052

ENGINEERING

Frequency-shift carrier relaying equipment: study of alignment procedures and of response in presence of noise	5053
Carrier frequency studies on high-voltage lines: propagation, attenuation, channel isolation, coupling and operation during faults	5054
KEYSER, G. M., BROWN, R. D., KORTSCHINSKI, J. — Development of power system protective relays using electronic techniques	5055
KEYSER, G. M., GRIFFIN, J. D. A. — Experiment on data presentation techniques utilizing computer data sources and visual displays	5056
MARTIN, W. A. — Study of fracture of boiler tubes	5057
Improve the adherence of sprayed zinc coatings	5058
VANDERLECK, J. M., IWANUSIW, O. W. — Transient performance of relaying-type current transformers	5059
VANDERLECK, J. M., TEMPLETON, J. G. C. — Statistical sample testing of single-phase watthour meters in service	5060
WATSON, W., BOZOKI, B., KORTSCHINSKI, J. — Development of solid-state high-speed protective relay systems	5061
WATSON, W., MANCHUR, G. — Study of relationships between power-system loads and system voltage and frequency	5062
WATSON, W., MANCHUR, G., LEE, D. C. — Studies of behavior of large interconnected electric power systems, including effects of governors and computer studies of voltage regulator effects	5063
WEST, G. H., STRICKER, S. — Influence of air leakage in residential structures on humidity level, air cleanliness and heating cost	5064

**Ontario Research Foundation
Department of Applied Microbiology**

CAMPBELL, L. A. -- Use of gamma radiation in wastewater purification	5065
--	------

ENGINEERING

**Ontario Research Foundation
Department of Engineering and Metallurgy**

ADAIR, T. H., BRATINA, W. J., MCGRATH, J. T. — Metal physics research: study of deformation of metals (e.g. fatigue)	5066
ADAIR, T. H., MCGRATH, J. T. — Study of euectic metal composites	5067
ADAIR, T. H., NISKANEN, E. — X-ray labs: development and application of specialized analytical X-ray techniques	5068
CAVANAGH, R. L., ALLEN, C. J. — Ferrous metallurgy research: development of ideas and processes in fields of process metallurgy and ore dressing	5069
CAVANAGH, R. L., HOLLINGBERY, D. — Investigation of a tarnish resistant copper alloy	5070
CAVANAGH, R. L., LAST, A. J., HISLOP, T. — Ultrasonic applications: application of ultrasonic energy to industrial processing, priority on emulsification	5071
CAVANAGH, R. L., NISKANEN, E. — Study of oxide films on copper alloy	5072
CAVANAGH, R. L., VINCZE, L. J. — Investigation of pellet binders for ore concentrates	5073
WILLIAMS, F. D. M., ACTON, K. — Reverse osmosis engineering studies	5074
WILLIAMS, F. D. M., BROWN, L. M. — Velocity seismograph development	5075
WILLIAMS, F. D. M., REMEDIOS, E. — Computer stress analysis program	5076

**Ontario Research Foundation
Department of Physical Chemistry**

SEFTON, V. B., HOPTON, F. J., LAUGHLIN, R. G. W. — Development of process for recovery of sulphur from sulphur dioxide in flue and smelter gases	5077
--	------

ENGINEERING

**Ontario Water Resources Commission
Division of Research**

HARRIS, A. J., ANDREWS, R. H. G. — Subsurface aeration systems — Lagoons-investigation of supplemental aeration on lagoons treating domestic waste	5078
Control of flowing wells — a study to find methods of controlling flowing wells	5079
HARRIS, A. J., BLACK, S. A. — Modified activated sludge for phosphate removal	5080
Starch treatability studies — investigation of treatability of potato and corn starch wastes alone and mixed with domestic sewage	5081
Model Sewage Treatment Plant development — design, construction, and use of a model plant for investigation of sewage treatment processes and waste treatability	5082
Animal waste disposal — a literature review of subsequent pilot studies on treating animal wastes	5083
Oxidation ditch for effluent polishing — pilot plant study	5084
HARRIS, A. J., FIELDING, M. B. — Biological reactance rates — investigation of rates of biological degradation of various artificial substrates	5085
Hydraulic characteristics of filter media — tests on various common water treatment filter media, with clear water head loss characteristics	5086
HARRIS, A. J., FIELDING, M. B., BLACK, S. A. — Vortex aerator evaluation — test on "Ashbrook Inline Aerator"	5087
HARRIS, A. J., ODA, A. — Drilling fluid evaluation — analysis and testing of an organic base well drilling fluid	5088
Water plant sludges — investigations of production and disposal of sludges from water treatment plant	5089
Algal-caused tastes and odours — a review of past experience with cause and treatment of water supply tastes and odours caused by algae	5090
Ultra-violet sterilization — a literature review of the use of ultra-violet light in the sterilization of potable water	5091

ENGINEERING

- Zeta potential study — investigation of microelectrophoretic properties of various materials and study of the use of zeta potential measurements in water treatment 5092

Toronto Harbor Commission

- FRICBERGS, K., JONES, J. H. — Shore stabilization by use of construction excavation material to create beaches 5093

Abitibi Paper Co. Ltd.

- GUNNING, J. R. — Newsprint for web-offset printing 5094

- MANCHESTER, D. F., HOLDER, D. A. — Refined groundwood from jack pine 5095

Aerofall Mills Limited

- TURNER, R. R., POWELL, C., GOODFELLOW, H. D. — Methods including equipment to control air pollution 5096

Aluminium Laboratories Limited

- GODARD, H. P. — Long-term exposure of aluminium alloys in natural environment 5097

- HIRSCHFIELD, J. A. — Determination of weld hot short cracking susceptibility of various combinations of aluminium parent and filler alloys 5098

- The influence of process variables and materials on porosity in aluminum weldments 5099

- HOWITT, F. — The recovery and recrystallization behavior of aluminium alloys 5100

- SPOONER, R. C. — Study of the aluminum anodizing process 5101

- SUTHERLAND, J. G. — Static and fatigue behavior of aluminium alloys 5102

ENGINEERING

Atlas Steels Company

CARSON, R. O., GRAHAM, R. G. — Development of the continuing casting process	5103
CROSSLAND, K. — Development of vacuum arc melted grades of alloy steel	5104
LITTLE, J. — Development of an improved remelting process for quality alloy steels	5105
SETH, B. — Development of high speed quality tool steels	5106
Evaluation of thermal fatigue resistance of materials and development of superior die materials for die casting of bars	5107
TOOMVER, T., WHITAKER, W. — Investigation of chemical and metallurgical factors influencing machinability of stainless steels	5108
WHITTAKER, D. — Development of the Electroslag process	5109

Atomic Energy of Canada Limited

CHAUNDY, C. J. F., WISE, M. E. — Development of a computer-controlled system for remote x, y, z positioning of a radiation detector and for magnetic tape digital recording of the detector output	5110
ROUND, K. J., HARE, G. E., PUDDY, D. C. — Development of micro-watt, milliwatt and multiwatt power sources using radioisotopes as the source of energy for application to systems requiring high reliability and long life	5111
TOLMIE, R. W., BRISTOW, Q., CHURCHILL, T. R., DONHOFFER, D. K. — Projects involving the use of radioactive sources for gauging mass, thickness, and density. Development of electronic radiation measurement devices	5112

Canadian Gas Association

HAY, R. L., GILBERT, L. H., ANDERSEN, H. — Heat exchanger research program: to provide design parameters for manufacturers to evaluate new heat exchanger designs and generally upgrade the appliance	5113
HAY, R. L., TANEJA, J., WILLIAMSON, F. D. — Water Heater Research Program: to provide manufacturers with design data while overcoming problems of corrosion, liming, scaling, and noise	5114

ENGINEERING

Canadian General Electric

BRADSTREET, B. J. — Exploration of defects associated with high speed automatic welding of mild steel ¹	5115
BRADSTREET, B. J., CHAPMAN, H. — The ultrasonic examination of structural steel welds ¹	5116
DE BUDA, R., CHOW, S. M. — Research into the information theoretic aspects of maximizing use of available channel capacities, including channel modelling, signal encoding and signal decoding ²	5117
ELGAR, E. C. — Application of calorimetric techniques to the determination of local losses in electrical apparatus	5118
ELLIS, J. R., BRIGGS, H. A., RAHMAN, M. A. — Measurement of losses in silicon steel at high densities and with controllable complex wave form	5119
JAGGER, C. E., KATCHKY, M., McLAUGHLIN, R. H. — Research into high speed electronic signal processing systems and circuits in communications and echo location applications, including analytic and experimental studies ¹	5120
MULHALL, V. R., ATKINSON, E. A. — Evaluation of corona endurance capabilities of insulating systems ²	5121
SCRIMGEOUR, J., BUTLER, R. E. — Systems design for direct digital control	5122
SCRIMGEOUR, J., HAMILTON, R. E. — Analytical investigation of processes in the mining industry to develop mathematical models and control strategies for computer control of selected processes ²	5123
SCRIMGEOUR, J., NUNWEILER, D., GORDON, R. A., BURNETT, T. C. — Analytical investigation of processes in the pulp and paper industry to develop mathematical models and control strategies for computer control of the continuous digester, bleach plant and paper machine ²	5124

¹ Jointly sponsored by National Research Council.

² Defence Industrial Research Grant—Defence Research Board.

ENGINEERING

Canadian Structural Clay Association

SCOTT, G. K. — Development of an industrialized building system based on prefabrication of structural clay products of existing or new design ¹	5125
--	------

Canadian Westinghouse Company Limited

DEVINE, R. E., SMITH, M. — Design problems in power capacitors	5126
GROBA, F. A., CLARK, F. A., PORTEOUS, C. — Studies on aging of electrical insulation under thermal and electrical stress	5127
GRAHAM, N. A., DIXON, P. R., DALAL, K., WYSIEKERSKI, A. G. — — Research and development on alloys of zirconium	5128
GRAHAM, N. A., HUDSON, M. J. B., MOORE, D. — Studies on corrosion of metals used in nuclear reactor construction	5129
GRAHAM, N. A., SEDMIHRADSKY, P. — Research and development on methods of joining zirconium and its alloys	5130
HARBELL, J., PRICE, M. — Design problems in power transformers	5131

Champlain Power Products Limited

ILLINGTON, I. J., BELL, R., RAYFIELD, J. — Hydrostatic shaft seals ²	5132
IOQUE, R. H., HENDERSON, D. J. ² — Elliptical shaft seals	5133

Cominco Limited

Product Research Centre, Sheridan Park, Ontario

CROWN, J. A., WATSON, T. W., SURANA, N. S. — Physical metallurgy of lead and zinc alloys	5134
LEWIS, G. P., BOOKER, P. P. — Mechanical properties of galvanized steel	5135
LEWIS, G. P., BOOKER, P. P., WRIGHT, M. M., PIERCY, R. C., WATSON, T. W. — Hot dip galvanizing	5136
HIMIZU, H. H., PARSONS, D. V., SEYMOUR, T. J. — Zinc extrusion	5137

Research in Cooperation with Escott Building Corporation Limited.
Research being conducted by Dilworth, Secord, Meagher and Associates.

ENGINEERING

SHIMIZU, H. H., POLING, H. E. — Continuous casting	5138
Zinc alloy die casting	5139
Zinc gravity casting alloys	5140
SHIMIZU, H. H., WILD, A. W. — Fabrication of zinc alloy products	5141

Computing Devices of Canada Limited

GRUNO, R. S., BECK, J. R., DAWSON, J. E. — Development of high-G telemetry. Develop self-contained telemetry to survive gun launch and impact acceleration roads	5142
IRVINE, I. J., CHRISTENSEN, A., WESTWOOD, P., GAMMON, J. — Random data processing. Research into techniques for using digital computers to extract meaningful information from data corrupted with random noise	5143
IRVINE, I. J., DURE, J. D. — Experimental investigations of a high speed printing technique for display of pictorial and alphanumeric data	5144
IRVINE, I. J., MACAULEY, B., IRWIN, M., SHAW, E., GRAVES, R. — Signal detection. Research into methods for signal detection and parameter measurement using digital computers	5145
IRVINE, I. J., McLOUGHLIN, G. T., WADDEN, C. G., EMMENS, D., BRUCE, I. — Pattern recognition. Research into pattern recognition techniques for digital computers	5146
IRVINE, I. J., ROBINSON, C. R., ALEXANDER, J. C. — Investigations on specialized digital computer organizations for navigation systems	5147

Desitron Company Limited

ZELINGER, G., JOSHI, V. — Microwave industrial research: development and design of microwave components for microwave heating (and radar) application ¹	5148
--	------

¹ Sponsored by National Research Council.

ENGINEERING

Dilworth, Secord, Meagher and Associates

BELL, R. P., NIXON, M. L. — Component studies for high temperature liquid metal systems ¹	5149
BELL, R. P., STAMBOLICH, J. — Mathematical modelling of nuclear reactor transients	5150
BILLINGTON, I. J., BELL, R. P., RAYFIELD, J. A. — Research related to the operation of controlled leakage seals for rotating shafts ²	5151
BILLINGTON, I. J., BROWN, W. S., NIXON, M. L. — Study of emergency cooling problems in nuclear reactors ¹	5152
BREMNER, G. F., GOULDING, H. — Aerodynamics of dykes and windbreaks ³	5153
BREMNER, G. F., NIXON, M. L. — Analytical and experimental studies of aerodynamic loads on and flow patterns around buildings and structures	5154
BROWN, W. S. — Investigations and analysis of control system requirements for nuclear reactors using fast fuel ¹	5155
RAYFIELD, J. A. — Experimental study of mass transfer in flowing liquid metal ¹	5156

Eldorado Nuclear Limited

CRAIGEN, W. J. S., PITTUCK, A. D., TEALE, A. R. — Production of ductile zirconium metal from zircon sand	5157
JOE, E. G., BALLANTYNE, S., FEASBY, D. G. — Recovery of uranium from ores, concentrates, etc.	5158
MELVANIN, F. W., HART, J. L., ZAWIDZKI, T. W. — Production of improved magnesia refractories	5159
SMART, B. C., WILKINSON, R. G. — Investigations into production of refined uranium compounds	5160

¹ On behalf of Atomic Energy of Canada Limited.

² On behalf of Champlain Power Products.

³ On behalf of the St. Lawrence Seaway Authority.

ENGINEERING

Escott Building Corporation Limited

- ESCOTT, G. K. — Development of an industrialized building system based on prefabrication of structural clay products of existing or new design¹ 5161

Ferranti-Packard Electric Limited

- BELAK, M. J. — Development of active and passive filters based on optimised designs for wide temperature ranges 5162
- BOHDANOWICZ, A. B., WHERRY, F. E. — Development of method of calculating internal corona inception or gassing voltage at any point in an oil filled transformer 5163
- DAVIS, H. J., KINNIBRUGH, D. R. — High temperature molten carbonate hydrocarbon fuel cells, batteries and related control equipment 5164
- KEIL, C., KOCHER, H., WAGERER, G. — Development of hypothesis for predication of corona inception in insulation structures of oil and oil impregnated paper during power frequency, impulse and switching surge test 5165
- MACKIMMIE, R. D. — Development of solid state control for step voltage regulators operating at 36 K.V.A. upwards 5166
- MCQUIRK, D. J., TAYLOR, M. K., WINDROW, D. — Electro optical data reader and display for commercial use 5167
- ORT, H. A., EASSON, K. W. — New techniques for employing aluminium strip for windings in distribution transformers 5168
- SIMO, E., ZEPIC, Z. — The effect of drying and degassing of transformer insulations (including oil) on the point of corona inception during dielectric tests 5169
- SMITH, C. N. — Small electromechanical ambient light alphanumeric display 5170
- TURNBULL, J. N. — Development of improved machines for reading and handling punched data tape 5171

¹ Research for Canadian Structural Clay Association.

ENGINEERING

TYLER, A. R. — Development of equipment for precision plotting of magnetic field distribution in particle accelerator magnets, (at A.E.C.L. Chalk River) 5172

Garrett Manufacturing Limited

ATKINSON, B. W., GILL, P. S., PEARS, B., ABRAHAMSOHN, G., BISSET, H. A., PRINCE, C., KERSHAW, P. — Flight instrument test sets. To develop self-contained flight instrument test set (pneumatic signal generators), which by means of manual control or digital program input provide highly accurate and stable altitude and airspeed signals to simulate static and dynamic flight conditions of aircraft 5173

HICKLING, C. D., DYSON, G., STAUSKAS, P., ROBERTSON, J. — Static power supplies. To develop static inverters which operate from DC power sources and deliver regulated AC power, ranging from a few VA up to approximately 2.5KVA 5174

RICHARDSON, R. J., ZUTRAUEN, S., MARSHALL, R., MITCHELL, R., WESOLOWSKI, A., BERNARD, M. — Temperature control systems. To develop temperature control systems which include solid state electronic controllers, temperature selectors, duct sensors and anticipators which are employed for various aircraft 5175

ROSE, G. W., LAWRIE, G., PYTEL, L., HARDY, J. — Radio emergency beacons. To develop radio emergency beacons and downed aircraft locators which, transmitting signals on both the military and commercial distress frequencies, are capable of expediting the rescue of personnel who have been involved in aircraft forced landings over land or water 5176

Geophysical Engineering and Surveys Limited

FRASER, D. C. — Helicopter-borne continuous wave electro-magnetic equipment with three orthogonal receiving coils for measurement of a conductor's secondary field vector¹ 5177

An airborne multi threshold gamma ray spectrometer with emphasis on signal-to-noise optimization for a fixed size of crystal² 5178

¹ With A. R. Barringer of Barringer Research Limited.

² With A. Stevens of McPhar Geophysics Limited.

ENGINEERING

Johnson, Matthey and Mallory Limited

BOURGAULT, P. L., FRASER, G. H., BURGER, D. W. R. — Research on electrolytic integration	5179
BOURGAULT, P. L., FRASER, G. H., BURGER, D. W. R. — Research on thermistors	5180
BOURGAULT, P. L., RANFORD, R. E., BATELAAN, J., FRASER, G. H., BRUVELAITIS, S., ADDIE, L. A. — Research on tantalum/tantalum oxide systems for high frequency electrolytic capacitors	5181

Litton Systems (Canada) Limited (Litton Industries)

KYDD, J. — Automation in the design of digital computers for avionic and other military applications	5182
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M and T Products of Canada Limited

GOULDEN, P. D., DEMARCHE, R. — Removal of tin from scrap tin plate	5183
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Marsland Engineering Limited

ARMSTRONG, A. S. — Ceilometers for airport control	5184
ARMSTRONG, A. S., DIETZ, R., PRICE, B. — Visual range computers	5185
FAIREY, B. — Miniaturized microphone and receiver capsules	5186
FAIREY, B., CONNER, J. — Sound propagation over 360° in open space for auditoriums, swimming pools, and exhibitions, i.e. special speaker system	5187
JONES, J. N., MORITZ, F., PRICE, B., FAIREY, B. — Special field telephone sets, self-powered	5188
LEESON, F. D., ROWE, R., GRUNWELL, M. — Sonar simulators for training aids	5189
MARSLAND, L. H., ARMSTRONG, A. S., PRICE, B. — Small analogue plotting systems	5190
NIERGARTH, L. — Special purpose power supplies for electro-plating	5191
WALKER, R. W. — Line bridging amplifiers for communication circuits	5192
WALKER, R. W., CONNER, J. — Solid state stereo and public address amplifiers (15 watts to 100 watts)	5193

ENGINEERING

Northern Electric Company Limited

CRAIG, J. A., ENTWISTLE, S. D. — Precious metal contacts. Study of the basic mechanism of adhesion and its avoidance in gold-silver alloys used in low energy low force electrical contacts	5194
DAVIDSON, I. A., HANTUSCH, G. H. — Study of large scale integrated circuits, including the use of redundancy to improve the overall process yield. The development includes the use of both bipolar transistors and MOS field effect devices	5195
ENTWISTLE, S. D., CRAIG, J. A., FORSTER, B. — Study of permanent magnetic alloys, characterized by low magnetostriction, high magnetic saturation and controllable coercive force properties. Research directed towards memory module applications	5196

Northern Radio Manufacturing Company

DESBRISEY, A. W. Y., KRUPPA, J. — Development of high-speed data modems	5197
DESBRISEY, A. W. Y., KRUPPA, J. — Development of data code translators	5198
KRUPPA, J. — Development of multi-code data selector modules	5199

Sinclair Radio Laboratories Limited

BUCKLES, F. G., DELORENZI, C. — Radio frequency intermodulation test bed	5200
BUCKLES, F. G., LAINEVOOL, J. — Autotune — cavity resonators and control circuitry	5201
GRAHAM, G., BELCHER, R. — High frequency shipborne multicoupler	5202
GRAHAM, G., POLETNEFF, A. — Digitally tuned coupler	5203
LAINEVOOL, J. — Antenna feed study	5204
RECORD, A. H. — Weather satellite receiving station	5205
TILSTON, W. V., CASTRUCCI, P. — Biconical antenna	5206
TILSTON, W. V., MORRISON, J. — Low frequency duplexer	5207
Orthogonal mode antenna system	5208

ENGINEERING

Spar Aerospace Products

FARRELL, K. — Research into materials, processes and mechanisms related to extendible antennas and masts in earth environment	5209
FARRELL, K., LANG, G. — Research into materials, processes and mechanisms related to spacecraft extendible booms and antennas. Extension of research previous completed in 1966/67	5210
GRAY, G., MCKENDRY, J. — Coulometric charge control of nickel-cadmium batteries, employing solid state chargers. Positive detection of fully charged batteries and control of the charge during recharge cycle	5211
Coulometric devices. Methods of producing coulometers to measure charge status of Ni-Cad batteries	5212

Sprague Electric of Canada Limited

BURGER, F. J., WU, J. C., RENES, A. — Materials and processes for electrolytic capacitors	5213
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Union Carbide Canada Limited

BATA, G. L., HAZELL, J. E., PRINSEN, J. H. — Separation of δ -olefins	5214
BATA, G. L., SINGH, K. P., WOLF, C. A. — Technology of lubrication and heat-transfer phenomena of synthetic oxygenated polymers	5215

Varian Associates of Canada Limited

MACDONALD, K. A., VIANT, M. — Research on improvements to small microwave tubes	5216
SEARLE, C. E., BEEKER, K. D., SMITH, G. C. — Development of travelling wave tubes	5217
SMITH, E. R., SANDERSON, H. T. — Development of reflex klystrons in the following frequency bands — X, Ke, Ku, K and Ka	5218
VIANT, M. — Development of millimeter reflex klystrons and extended interaction oscillators	5219

Warner-Lambert Research Institute of Canada Limited

DE LA IGLESIA, F. A., LUMB, G. D. — Development of automatization in processing data from toxicological experiments (biological, chemical, haematological, and pathology analyses)	5220
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FORESTRY

VI

**Department of Lands and Forests
Research Branch, Forestry Section**

ANDERSON, H. W. — Ecological studies of the defect dynamics of tolerant hardwood trees, especially problems of discoloration and poor form of sugar maple	6001
Physiological studies of the nature and mechanism of formation of mineral streak in sugar maple	6002
Ecological studies of the effects of site, cover-density and delayed release on survival and growth of under-planted red and white pine, and white spruce	6003
BECKWITH, A. F. — Problems in measurement, recording and processing of data concerning the growth and yield of forest stands and individual trees	6004
Estimating the availability of timber resources and products	6005
Design and analysis of investigations to evaluate the productivity of artificial and natural stands	6006
BURGER, D., PIERPOINT, G. — Soil nutrients for tree growth: weathering of mineral soil materials, decomposition of forest humus, influence of vegetation on the soil	6007
Soil moisture for tree growth: quantifying regional soil moisture regime scales, internal sap pressure in plants	6008
CARMICHAEL, A. J. — Study of the relation of anatomical and chemical wood properties to product quality	6009
GORDON, A. G. — Growth and nutrition of spruce on a complete range of forest sites. Dry weight productivity and nutrient cycling in spruce forests. Ecology of spruce and spruce forests	6010
Studies of species and racial variation of the spruce genus in relation to growth and relative efficiency in nutrient uptake	6011
HOLOWACZ, J. — Advising on the economic aspects in the planning of forest research projects	6012

FORESTRY

Participating in forest research projects requiring economic analysis	6013
Investigating occasional market opportunities for forest products	6014
Studying the relationship between forest resources of Canada and those of Eastern Europe with special reference to the U.S.S.R., the principal prospective competitor in world forest products markets	6015
LARSSON, H. C., JACIW, P. — Establishment of selected high quality silver maple and eastern cottonwood in swamps devastated by the Dutch elm disease	6016
Establishment of high quality hard maple, poplar, red oak and black cherry in low quality mismanaged stands on the uplands	6017
Selection of high yielding trees of five maple species for the production of maple sap and syrup	6018
Use of silvicides, herbicides and soil sterilants for stand conversion, weed and shrub control, thinning and de-barking	6019
Detailed growth studies on hard maple, silver maple, black cherry, American basswood, white ash and eastern cottonwood	6020
LEECH, R. H. — Determination of the nutrient requirements of the principal forest species in Ontario in order to assist in the management program for the improvement of timber stands by fertilizer treatments. Research into aspects of fertilizer use, including application, measurement of response, and assessment of financial return	6021
LYON, N. F., McEWEN, J. K. — Studies in ecology, population changes, silvicultural characteristics of the spruces, pines, fir and intolerant hardwoods of northern Ontario	6022
Studies of drainage and the effects of excessive moisture conditions on growth of black spruce in the Cochrane Clay Belt and northwestern Ontario	6023
MCLEAN, M. M. — The development and testing of management techniques to improve quality and growth of tolerant hardwood forests	6024

FORESTRY

MULLIN, R. E., GLERUM, C. — Research in aspects of artificial regeneration for the technical and scientific improvement of the reforestation program	6025
RAYMOND, F. L. — Biomathematical research and computing services; adjustments for bias in populations of biological data; multiple and multivariate analyses	6026
SINCLAIR, G. A. — The use of prescribed fire in hardwood management	6027
Mechanical and chemical cleaning in young hardwood stands	6028
The effect of pelleted herbicides in <i>Ribes</i> eradication	6029
SKEATES, D. A. — Study of the effect of seed origin and degree of selectivity of cone collection on various aspects of forest establishment and growth	6030
Study of physical and chemical aspects of seed, as affecting germination of seed and early growth of seedlings	6031
STROEMPL, G. — Seed quality, treatment, germination and regeneration of American basswood	6032
Afforestation of difficult sites in southern Ontario by special planting methods	6033
ZUFA, L., RAUTER, M. — Tree breeding work, involving spruce, poplar and pine	6034

**Ontario Research Foundation
Department of Organic Chemistry**

LADELL, J. L. — Study of underlying causes of variation in cell size of wood	6035
REID, S. G., LEMON, H. W., BERI, R. M. — Utilization of conifer foliage	6036
SUGDEN, A. — Resin distribution in Ontario trees and the effect on pulp and paper quality	6037

LIFE SCIENCES

VII

**Department of Agriculture and Food
Ridgetown College of Agricultural Technology**

BEATTIE, D. — Low-cost rations for dairy cows using corn silage and high moisture grains	7001
The use of corn Stover Silage for beef cows in feedlot	7002
LUCKHAM, D. G. — Effect of high fat finishing rations and age at marketing on grades of turkeys	7003
Delaying sexual maturity of meat-type breeding pullets	7004
Protein levels for broilers	7005
High moisture grains for poultry	7006
Effect of varying protein levels for laying hens	7007
LUCKHAM, D. G., STEWART, S. — Effect of increasing light intensity on rate of egg production	7008
SCHULD, F. W. — Beef nutrition and husbandry research project	7009
Swine nutrition and husbandry research project	7010

**Department of Lands and Forests
Research Branch, Fisheries Section**

ADDISON, W. D., RYDER, R. A. — To prepare an annotated bibliography on walleyes and on closely related North American species	7011
BERST, A. H. — To determine the effects of disease on the survival of planted trout	7012
BERST, A. H., DEWAR, J. E. — To develop through artificial selection, a stable, reproductive hybrid between lake trout and brook trout which will be capable of living in the Great Lakes habitat formerly occupied by the lake trout	7013

LIFE SCIENCES

- BERST, A. H. — To describe the life history and ecology of splake (hybrid between brook trout and lake trout) introduced into natural waters 7014
- To explore the potential of selective breeding of fish as a technique in modern fish management in changing environments 7015
- BERST, A. H., LEWIS, C. A., SMITH, J. — To describe the survival growth and life history of splake (hybrid between lake trout and brook trout) planted in various parts of Lake Huron. Their contributions to the fishery and their vulnerability to sea lamprey predation 7016
- CHRISTIE, W. J. — To determine and describe the factors causing the violent fluctuations in abundance of whitefish in the Bay of Quinte and Lake Ontario. This is an outgrowth of a study which demonstrated that the traditional whitefish fry plantings did not contribute significant numbers of fish to the fishery 7017
- CHRISTIE, W. J. — To assess the possibility of re-establishing a commercially useful population of lake trout in eastern Lake Ontario while the sea lamprey population continues to exist in the area 7018
- To trace the arrival and build-up in Lake Ontario of white perch, a new species in this lake, and to assess its impact on the other resident species. The study is also designed to obtain the kind of information necessary to management in the event that a commercial or sport fishing for the species develops 7019
- To explore, using trawls, the open part of Lake Ontario for stocks of fish of commercial value 7020
- CHRISTIE, W. J., HURLEY, D. — To determine the life history and movements of the American eel in Lake Ontario and tributary waters, to assess potential of population for increased exploitation by commercial fishermen and to assess the effect, if any, of the installation of the St. Lawrence Seaway on the size of the population 7021
- CHRISTIE, W. J., LANE, E. D. — To attempt the introduction of Kokanee, a land-locked variety of sockeye salmon, to Lake Ontario in an effort to complement existing fish stocks with this new species. Populations to be used for commercial and sport use 7022

LIFE SCIENCES

COLLINS, J., LEWIS, C. A. — To attempt the introduction of Kokanee to Lake Huron	7023
DECHTIARENKO, A. — To document the build-up, in the smelt of Lake Erie, of the sporozoan parasite, <i>Glugea hertwigi</i>	7024
To survey the parasites occurring in the important fish of Lake Ontario and to discover which of those may be important in- fluences on abundance of fish	7025
DIRKSEN, A. — To describe the early life history and ecology of walleyes in west Lake Erie and Lake St. Clair	7026
FERGUSON, R. G. — To study spawning smelt throughout Lake Erie to determine whether there are discrete spawning populations which may require special management	7027
To describe the horizontal and vertical distribution of smelt in Lake Erie and to determine the environmental factors which influence that distribution. This will allow prediction of the location of smelt concentration and help in the development of new fishing gear; and will contribute towards an ability to predict long range trends in the fishery	7028
To study the factors related to the alternate strong and weak year classes of smelt in Lake Erie	7029
To monitor, by sampling, the catches made by Lake Erie com- mercial fishermen in order to assess the status of the various fish populations and the impact of the fishery on these popu- lations	7030
FERGUSON, R. G., DIRKSEN, A. — To develop, if possible, index fish- ing stations at which samples of the young-of-the-year fish rep- resentative of the entire Lake Erie population situation can be taken. If successful this will allow longer range predictions of expected conditions	7031
FRASER, J. M. — To measure and describe the scope of normal, year to year changes in natural brook trout populations	7032
To increase the numbers of brook trout available to anglers by manipulating the harvest	7033
To investigate the possibilities of providing spawning facilities (artificial if necessary) for brook trout to improve success of natural reproduction	7034

LIFE SCIENCES

To determine the potential use of fish toxicants in the management of lakes for brook trout	7035
To investigate the role of white suckers in limiting the survival of planted brook trout in lakes	7036
FRASER, J. M., CUCIN, D., JERMOLAJEV, E. — To investigate the variety of lake environments inhabited by brook trout with a view to developing a useful classification of such lakes	7037
FRASER, J. M. — To develop a practical stocking rate formula for types of brook trout lakes in order to use hatchery stocks more efficiently	7038
FRASER, J. M., MARTIN, N. V. — Algonquin Park Creel Census: — The measurement of the harvest of important game species by anglers in a number of waters annually. This provides a measure of the natural variation in the population between years and eventually a known background on which to assess the effects of management technique	7039
HURLEY, D. — To assess the extent of exploitation by anglers and by commercial fishermen on the walleye population of the Bay of Quinte during times of both scarcity and abundance, and to determine whether the two kinds of fishermen actually compete for fish	7040
To study the growth of a number of species (suckers, yellow perch, etc.) using special injections which are deposited in the bones and scales of the fish to form timemarks	7041
LEWIS, C. A., — To document the contribution of successive year classes of small mouth bass to the sport fishery of South Bay. These data test the reliability of predictions of the quality of bass angling based on temperature index known to influence class year strength of bass in their first year of life	7042
LEWIS, C. A., HARRISON, J. — To develop a general program of research on Lake Superior replacing former program of Fisheries Research Board — Principally dealing with Lake Trout	7043
LEWIS, C. A., RECKAHN, J., COLLINS, J., KWAIN, T. — To discuss and describe the factors influencing the strength of whitefish	

LIFE SCIENCES

year classes throughout Lake Huron. Fluctuations of abundance, related to variable year class strength is a major problem. Whitefish stocks, now known to be discrete, are being sampled in areas such as North Channel, Georgian Bay, South Lake Huron, South Bay, as a means of establishing the relative strength of year classes in the fisheries. These are then related to the limnological and meteorological conditions prevailing during their early life in search of relationships	7044
LOFTUS, K. H. — To evaluate the success of planting small mouth bass fingerlings in lakes already supporting a bass population	7045
To measure the sub-lethal effects of detergents on smallmouth basses, e.g., do they affect reproduction, feeding, respiration, activity?	7046
To study the factors involved in the production of eggs, fry, and fingerling smallmouth bass, with a view to determining how summer temperatures influence year class size in Lake Opeongo	7047
To determine the factors influencing the growth of smallmouth bass during their first year of life and to determine their effect on the ability of the bass to survive their first winter	7048
MARTIN, N. V. — To compare plankton feeding with fish feeding lake trout in terms of growth rate, age at maturity, population stability, egg production quality of fish produced, and management techniques necessary	7049
To discover the reasons for the poor survival of hatchery reared young lake trout when planted in lakes, e.g. Opeongo of the Laurentian Shield. The role of soft water vs. hard water is now being investigated	7050
MARTIN, N. V., JERMOLAJEV, E. — To study the very early life history and ecology of lake trout to discover whether this stage is important in determining the numbers of lake trout in a population from year to year	7051
MCCOMBIE, A. M. — To study the plant plankton of the Bay of Quinte, Lake Ontario, and make qualitative and quantitative comparisons with 1945 data with a view to determining the effects of and rate of eutrophication (aging and enrichment)	7052

LIFE SCIENCES

To study specific physical (temperature, seiches, currents) and chemical (oxygen, hardness, pH, etc.) conditions of water in relation to areas and times specified as important to particular fisheries problems	7053
McCOMBIE, A. M., LOFTUS, K. H. — To provide liaison in fisheries interest with the Great Lakes Institute, University of Toronto, in respect to the support provided for that agency in its limnological research on the Great Lakes	7054
RECKAHN, J. — To measure the survival and growth of young fish in Lake Huron and to describe their feeding habits	7055
To document through experimental fishing and sampling the long term changes in fish populations vulnerable to pound nets in South Bay, Lake Huron. Such changes have been found to be roughly representative of the situation throughout Lake Huron as a whole	7056
To discover and study the factors influencing class year strength (Survival of white fish during their first year of life) in South Bay. Directed at young fish-locations at various times of year, and methods of trapping to study	7057
RYDER, R. A. — To discover and describe a practical index or indices that will be useful in predicting the fish production potential of lakes	7058
To study the horizontal and vertical variations of total dissolved solids and total alkalinity during the open water period in an oligotrophic (young) lake. In using total dissolved solids or total alkalinity for estimating the productivity of a lake the seasonal fluctuations of these parameters must be understood if sampling requirements across the province are to be reduced to a practical level	7059
RYDER, R. A., ADDISON, M. D. — To describe the ecology of walleyes in a lake typical for walleyes in Ontario to provide an improved basis for management of the species	7060
RYDER, R. A., MARTIN, N. V. — To study the suitability of the Arctic grayling as a sports fish in Ontario	7061

LIFE SCIENCES

**Department of Lands and Forests
Research Branch, Wildlife Section**

FYVIE, A., JOHNSTON, D. H. — Diseases and parasites of wildlife — their effects on wildlife populations and their influence on livestock and humans	7062
HEPBURN, R. L., ADDISON, R. — Big game — populations, distributions, ecology, and reproduction of deer, moose, and caribou. Effects of weather, hunting, predation, range quality. Assessment of infrared for censusing	7063
KOLENSKY, G. B., ADORJAN, A. — Predators — populations, distribution, ecology, reproduction of wolves, coyotes, black and polar bears. Effects of wolves and coyotes on prey populations	7064
LUMSDEN, H. G. — Upland game and water fowl — populations, distribution of ruffed grouse and prairie grouse. Studies of reproduction of Canada geese	7065
STEPHENSON, A. B., STANDFIELD, R. O. — Fur bearers — population, distribution, ecology and reproduction of beaver and otter. Effects of trapping, predation, range quality: analysis of harvest statistics for most fur bearers	7066

**Hydro-Electric Power Commission of Ontario
Research Division**

UGGITT, J. W., EFFER, W. R. — Dissolved oxygen content of heated-water discharge from power plants	7067
Study of methods and materials for aircraft application of blackfly larvicides to streams	7068
UGGITT, J. W., EFFER, W. R., PARKER, G. L. — Studies of organophosphorus larvicides for blackfly and mosquito control	7069

**Ontario Research Foundation
Department of Applied Microbiology**

CHRISTISON, J. — Thermostable proteolytic enzymes of bacterial origin	7070
JERRA, G. — Inhibition of the initiation of the germination of bacterial endospores	7071

LIFE SCIENCES

Ontario Water Resources Commission Division of Laboratories

NEIL, J. H., CLARK, J. A. — A microbiological study of coliforms, streptococci, pseudomonads, and anaerobic bacteria, along with their respective fecal types to provide a spectrum of water pollution indicator organisms	7072
NEIL, J. H., McMANUS, ELIZABETH — Investigations on the distribution and nutrition of bacteria from lake sediments	7073
Heterotrophic bacteria from lake waters, their enumeration and identification	7074
NEIL, J. H., SCHENK, C., MICHALSKI, M. — A study of phytoplankton populations of the littoral waters of Lakes Ontario and Erie	7075
NEIL, J. H., SCHENK, C., OWEN, G., OSMOND, D., GERMAN, M., CONROY, N. — Relationships between aquatic fauna pollution sources and other ecological factors	7076
NEIL, J. H., SCHENK, C., WELLS, D. — Laboratory and field bioassay evaluations of the effect of municipal and industrial waste discharges on aquatic life	7077
NEIL, J. H., SCHENK, C., WELLS, D., DIOSADY, P., BERG, W. — Accumulations of DDT in the biota of Ontario waters	7078
NEIL, J. H., SCHENK, C., WILE, MRS. I., NOWOSAD, R. — Laboratory and field evaluations of the safety and effectiveness of aquatic herbicides, insecticides and algicides	7079

Ontario Water Resources Commission Division of Research

HARRIS, A. J., CHRISTIE, A. E. — Primary productivity of eutrophic surface waters — investigations into the production and productivity of phytoplankton along a trophic gradient	7080
HARRIS, A. J., VAJDIC, A. H. — Algal taste and odour (history) — determination of the medium optimum for the isolation of actinomycetes; characterization of the agent responsible for the taste and odour. Development of techniques for the isolation in pure culture of the taste and odour causing algae	7081

LIFE SCIENCES

Atomic Energy of Canada Limited

CLARKE, R. L., VANDYK, G. — Development of a tissue-density measuring system based on the scattering of gamma rays for application to medical diagnosis ...	7082
COWPER, D. R., DAVIES, A. G. — Development of methods and equipment for gamma ray sterilization of hospital supplies and equipment ¹	7083
TOLMIE, R. W., CHURCHILL, T. R. — Development of radioactive tracer methods for application to industrial process studies	7084
TOLMIE, R. W., THOMPSON, C. J. — Development of a computer-controlled element analysis system using neutrons from the Antimony-124-Beryllium reaction and high-resolution solid state gamma ray detectors .	7085

Barringer Research Limited

MACDOWALL, J., MCNEIL, D. J. — The development of a rodent detector for biological studies ...	7086
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Canada Packers Limited

DONOVAN, R. G., CAMPBELL, D. W. — The use of enzymes for unhairing of hides and skins to be used in the manufacture of leather	7087
KHOUW, B. J. — Preparation of pancreatic enzymes for use in therapy	7088
KOH, T. Y. — Heparin for use in therapy	7089
LIKUSKI, H. J. — Available energy of feed raw materials	7090
WEBB, G. G., FUNG, J. — Factors affecting the shelf life of vacuum packaged cooked meats	7091
WITTY, R., LIKUSKI, H. J. — Evaluation of protein raw material used in animal feeds	7092

International Cellulose Research Limited

KAEPPNER, W. M., LEMAY, J. G. Y. — Structure of wood pulp fibres by electron microscopy	7093
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¹ In cooperation with the University Hospital, London, Ontario.

LIFE SCIENCES

Maple Leaf Mills Limited Master Feeds

BOWNESS, E. R., MORRISON, W. D., TREMERE, A. W. — To evaluate further a complete ration for male mink	7094
TREMERE, A. W., MORRISON, W. D. — To determine amino acid requirements of growing pigs when on restricted feeding	7095
To determine lysine requirements for growing pigs when pigs are fed ad libitum	7096
To determine response of holstein calves to treated protein and/or amino acid supplementation	7097

St. Lawrence Starch Company Limited

RIEDEL, G., NIMMONS, I. — Effluent treatment program involving the biological treatment of carbohydrate wastes with a yeast sludge in a modified activated sludge treatment unit for the purpose of converting the waste material into a pure yeast, which could be used as an animal feed supplement	7098
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Thompson Research Associates Limited

CRUICKSHANK, N. H., RADFORD, P. J. — Investigations into new germicide formulations to give a wider range of killing and increased durability to textile fabrics	7099
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Warner-Lambert Research Institute of Canada Limited

DE LA IGLESIAS, F. A., LUMB, G. D., SOSA-LUCERO, J. C., BELCH, A. — Functional and structural studies on the liver of senile animals	7100
DE LA IGLESIAS, F. A., LUMB, G. D., SOSA-LUCERO, J. C. — Study on the significance of subcellular changes associated with drug administration	7101
DE LA IGLESIAS, F. A., WALL, C., LUMB, G. D. — Base-line morphological studies for the application of non-human primates to drug testing	7102

LIFE SCIENCES

DE LA IGLESIAS, F. A., WALL, C., SOSA-LUCERO, J. C., LUMB, G. D. — Development of a functional test for the early detection of drug-induced metabolic changes	7103
LUMB, G. D., DE LA IGLESIAS, F. A.— Studies on the development of collateral circulation in the heart and drugs that modify it	7104
LUMB, G. D., DE LA IGLESIAS, F. A., SOSA-LUCERO, J. C.— Research into improved toxicology methodology for safety and efficacy of new drugs	7105
Study of the influence of nutritional background in the response of animals to drug administration	7106
Structural, ultrastructural, biochemical and metabolic studies on the in vivo and in vitro alterations induced in the liver by the administration of drugs	7107
MITCHELL, L., LUMB, G. D., DE LA IGLESIAS, F. A.— A study on the ideal biological conditions for animals in life time drug toxicity testing	7108
SOSA-LUCERO, J. C., DE LA IGLESIAS, F. A., LUMB, G. D.— Immune response of animals under nutritional and drug induced con- ditions	7109
Study on the influence of drug administration on the labelled amino acid incorporation in different hepatic subcellular frac- tions	7110
SOSA-LUCERO, J. C., DE LA IGLESIAS, F. A., LUMB, G. D., BENCOSME, S.— Development of an isolation procedure for the charac- terization of the specific granules of mammalian atrial myo- cardium ¹	7111

¹ In collaboration with the Department of Pathology, Queen's University, Kingston, Ontario.

PHYSICS

VIII

Ontario Research Foundation
Department of Physics

CHATFIELD, E. J. — Applications of electron microscopes and micro-probe analyzers	8001
PULLAN, H., ADOLPH, G., HEYLAND, G. — Doping of elemental and compound semi conductors by ion implantation	8002
PULLAN, H., BERTRAM, R. W. — Electrical and structural properties of thin films prepared under ultra-high vacuum conditions	8003
PULLAN, H., CHATFIELD, E. J. — Compound and refractory films deposited by explosive vaporization and study of their structures by electron microscopy	8004
PULLAN, H., NORRAGE, G. — Growth and properties of very large crystals for Ge(Li) spectrometers	8005

Abitibi Paper Company Limited

HUSSAIN, S. M. — Development of an ultra-high shear viscometer for paper coating	8006
YAN, M. M., LARSEN, M. L. — Flame retardant fibreboards	8007

Aluminium Laboratories Limited

HAY, R. H. — Study of hydrogen in aluminum	8008
--	------

Barringer Research Limited

MACDOWALL, J., MCNEILL, J. D., PENNOCK, T. — The use of the Barringer correlation spectrometer for military purposes	8009
MACDOWALL, J., MOFFAT, A. J. — Airborne atmospheric NO ₂ and SO ₂ pollution survey over cities of Chatanooga and Los Angeles	8010
The development of an absorption spectrometer for ultimate spacecraft use	8011

PHYSICS

MACDOWALL, J., MOFFAT, A. J., PENNOCK, T., MCNEILL, J. D.. DAVIES, J. — The development of electro-optical instruments for measuring liquids or vapours of value to mining, milling, and air pollution operations	8012
MACDOWALL, J., MOFFAT, A. J., WOOD, T. — The evaluation of single point against long path techniques of air pollution measurement	8013
MACDOWALL, J., NEWBURY, C., MOFFAT, A. J. — The use of the Barringer airborne NO ₂ measuring system to study the pro- duction of NO ₂ from NO in pollution plumes	8014
MACDOWALL, J., NEWBURY, C., WOOD, T., PARKER, J., MOFFAT, A. J. — The comparison between the Barringer technique of pollution measurement and chemical methods	8015

Canadian General Electric Company Limited

WENKOFF, M. P. — Research into coherent and noncoherent optical correlators and matched filters, both analytic and experimental ¹	8016
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Canadian Westinghouse Company Limited

LAKE, R. E. W., SAUNDERS, R. — Electroluminescence: development of electroluminescent phosphors and of photoconductor mate- rials	8017
Electroluminescence: development of electroluminescent display panels with and without memory stage	8018
Development of multicolour programmed displays	8019

PIECZONKA, W. A., BARBER, H. D. — Semiconductors: PN junctions. studies in bulk phenomena of silicon, device reliability	8020
---	------

PIECZONKA, W. A., CLAYTON, N. S. — Semiconductors: research on surface effects, metal oxide silicon studies, insulated-gate-field- effect transistors	8021
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PIECZONKA, W. A., O'SHAUGHNESSY, T. A. — Infrared optical prop- erties of silicon dioxide films on silicon and infrared properties of silicon-silicon dioxide interface	8022
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¹ Defence Industrial Research Grant-Defence Research Board.

PHYSICS

PIECZONKA, W. A., THOMPSON, D. -- Epitaxial growth of silicon films, studies on growth dynamics and perfection of grown films	8023
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**Cominco Limited
Product Research Centre, Sheridan Park, Ontario**

LEYLAND, B. K., LAURIENTE, D. H. — Lead for noise control in buildings	8024
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Computing Devices of Canada Limited

BADHWAR, L. K., JEAN, B. — Meteorological sound ranging studies. Develop improved mathematical models for sound ray calculation, using reported met. information	8025
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MURPHY, J. R. B. — Hypervelocity techniques investigation. Develop an augmentor system which will increase light gas gun velocities above the present 30,000 ft./sec.	8026
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MURPHY, J. R. B., ROLLINS, T. L., MOULDING, D. G. — Sounding rocket aeroballistic range program derive aerodynamic stability characteristics from free flight trajectory observations of a sounding rocket model	8027
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ROLLINS, T. L., JEAN, B. — Meteoroid impact flash analyser. By means of hypervelocity range impact tests, develop a technique for analysing meteoroid characteristics (mass, velocity, composition) by a spectral analysis of the impact flash	8028
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Dilworth, Secord, Meagher and Associates

BREMNER, G. F., GOULDING, H., COLADIPETRO, R. — Explosive decompression of high enthalpy water ¹	8029
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Dunlop Research Centre

DINGLE, A. D., DUDLEY, E. A. — Polymer to polymer adhesion Rheology of high polymers	8030
Dynamic mechanical properties of plastics and elastomers: non linear analysis	8031
.....	8032

¹ On behalf of Atomic Energy of Canada Limited.

PHYSICS

Duplate Canada Limited

BATESON, S., FICKERT, K. W. J., URBAN, P. — Ferroelectric ceramic materials based on lead metaniobate	8033
BATESON, S., HUNT, J. W., SINHA, N. K., GOLDING, W. — Study of thermal tempering of flat glass	8034
BATESON, S., KAPPES, K., LOMELAND, E. — Alumina ceramic mate-rails	8035

Edo (Canada) Limited

ADHAV, R. S. — Electro-optic crystals for display systems	8036
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Ferranti-Packard Electric Limited

ATHERTON, D. L. — Practical applications of superconductivity particular to DC generators and magnets for research, particle accelerators and M.H.D. generators	8037
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Huntec Limited

HUTCHINS, R. — Underwater seismic research. The determination of the physical and other engineering properties of the bottom and sub bottom of water covered areas by acoustic methods ¹	8038
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International Cellulose Research Limited

LUCE, J. E. — Paper toughness	8039
Softness and absorbency of tissue	8040
Physical properties of single wood pulp fibres	8041

Litton Industries, Litton Systems (Canada) Ltd.

FLANNAGAN, A., BRYAN, K. — Research in gas bearing technology	8042
MITCHELL, T. G., ROTHFUSS, H., FLANNAGAN, A. — Low cost in-ertial navigation system	8043
STEIN, H. A., MAU, A., YOUNG, W., THOMPSON, L. — Research in pattern recognition systems	8044

¹ With the Defence Research Board under the DIR program.

PHYSICS

Northern Electric Company Limited

BROGDEN, T. W. P., VINCENT, D. A. — Physics of interfaces between metals, insulators and silicon, for understanding and improvement of metal-insulator-semiconductor (MIS) devices	8045
CAUGHEY, D. M. — Computer simulation of junction devices by direct numerical solution of the time-dependent equations of continuity in semiconductors	8046
COLTON, D. R. — Thermodynamics of semiconductor dopant systems	8047
EASTWOOD, H. K., QUON, H. H. — Investigation of single crystal nickel ferrite	8048
KNEE, K. — Epitaxy on insulating substrates	8049
KREIGLER, R. J., BASINSKI, J. — Dielectric thin films	8050
LOW, N. M. P., BOYES, M. H., BARTLETT, M. W. — Investigation of polycrystalline manganese-zinc ferrite	8051
THOMAS, R. E., CAUGHEY, D. M. — Semiconduction properties of gold-doped silicon, with particular attention to the computer simulation of gold-doped silicon devices	8052
WHITE, J. J., MORRIS, J. D. — Diffusion of impurities in silicon and passivating films	8053

Spar Aerospace Products Limited

DICK, R., STONELL, A. C., KETTLEWELL, J. — Analytical research into methods of distinguishing rapidly moving celestial bodies from other light sources. This research will apply to the design of automatic stations for detecting and tracking meteorites for the purpose of determining their origins and earth impact points	8054
KERR, H. S., DICK, R. — Selection of optical materials for operation in a space environment. The research relates to optical equipment which will be carried aboard the Canadian satellite ISIS "B"	8055

**ADDRESSES OF PARTICIPATING COMPANIES
INCLUDING A SUMMARY OF
REPORTED INDUSTRIAL RESEARCH FACILITIES**

INDUSTRIAL RESEARCH FACILITIES

ABITIBI PAPER COMPANY, LIMITED

Toronto-Dominion Centre, Toronto 1, Ontario.

ABREX SPECIALTY COATINGS, LIMITED

280 Wycroft Road, Oakville, Ontario.

President: G. R. Bailey.

Fields of Interest: Research and development, consulting, electrodeposition of organic coatings, design of equipment for electrodeposition of paint and manufacture of organic coatings.

Major Activity of Company: Mfg. 20%, R&D 55%, Testing and Evaluation 5%, Consulting 15%, Other 5%.

Research Facilities: 1,000 square feet of completely equipped laboratory research offices.

Research Personnel: G. R. Bailey, President; F. R. Crowne, B.Sc. (Hons.), M.A.Sc.; H. J. Barton, Ph.D. (Chemical Engineering); G. Young, B.A.Sc.

Laboratory Staff: Full time technicians 4, summer students 2.

Recruiting Contact: F. R. Crowne.

A.D.M. CHEMICALS

Division of Valvoline Oil Company of Canada Limited,
200 Fairbank Avenue, Toronto 19, Ontario.

President: S. A. Cooke.

Fields of Interest: Company Products — protective coating resins and foundry sand binders. Research Activities — specialty fatty chemicals and novel polymer systems.

Major Activity of Company: Mfg. 85%, R&D 5%, Testing and Evaluation 10%.

Research Facilities: A modern 3,000 sq. ft., air-conditioned laboratory. Instrumentation includes infrared and ultraviolet-visible spectrophotometers, a nuclear magnetic resonance spectrometer and an automatic recording titrator.

Laboratory Staff: Inorganic chemists 1, organic chemist 1, chemical engineer 1, chemists 2, technicians 4.

Recruiting contact: R. C. Burrows.

INDUSTRIAL RESEARCH FACILITIES

AEROFALL MILLS LIMITED

2640 South Sheridan Way, Clarkson, Ontario.

President: Robert C. Meaders.

Fields of Interest: Mineral dressing, cement raw material processing
Industrial natural and synthetic minerals processing.

Major Activity of Company: Mfg., R&D, Testing and Evaluation.

Research Facilities: New facilities now being equipped at Clarkson.

Research Personnel: R. R. Turner, Technical Director; Clarence Powell,
Research Engineer; Dr. H. R. Goodfellow, Senior Research Engineer.

Laboratory Staff: Laboratory superintendent 1, laboratory technician 1,
research technician 1.

ALUMINUM LABORATORIES LIMITED

Box 8400, Kingston, Ontario

ATLAS STEELS COMPANY

Welland, Ontario.

ATOMIC ENERGY OF CANADA, LIMITED

P.O. Box 93, Ottawa, Ontario.

THE BALLDRIVE COMPANY

Box 634, Galt, Ontario.

Vice-President: John S. Couse.

Fields of Interest: Very high speed and low speed hydraulic radial piston
motors and pumps using free balls as pistons. Rolling contact
elastohydrodynamic lubrication, hertzian stresses analysis.

Major Activity of Company: Mfg. 35%, R&D 35%, Testing and Evaluation
30%.

Research Facilities: Model shop, engineering department, high speed testing
equipment both for endurance and performance tests. Torque sensors
(60,000 RPM). Pressure transducers, etc.

Research Personnel: John S. Couse, P. Eng.; Kenneth G. Vacing, P. Eng.
George Pain, Technician; R. G. Duncan, Tool maker.

Laboratory Staff: Special assemblies manager 1, quality control manager

Recruiting Contact: John S. Couse.

INDUSTRIAL RESEARCH FACILITIES

BARRINGER RESEARCH, LIMITED
304 Carlingview Drive, Rexdale, Ontario

President: Dr. A. R. Barringer.

Fields of Interest: Development, manufacture and sale of (a) air pollution measuring instruments, (b) geophysical exploration instruments. Research and Development of electro-optical techniques for instrumentation. R&D of in radio and electromagnetic methods of prospecting.

Major Activity of Company: Mfg. 20%, R&D 26%, Exploration Services 41%, Leases and Rentals 13%.

Research Facilities: UV, visible & IR spectrometers, 4,000 sq. ft. lab space allocated to R&D use. Low gradient magnetometer test facility Electro-optical laboratory. Photographic facilities. Electronic instrument development facilities.

Research Personnel: Mr. Joseph MacDowall, General Manager; Mr. W. Cox, Electronic Engineer; Mr. A. J. Moffatt, Electronic Engineer; Mr. D. McNeill, Senior Physicist; Mr. J. Davies, Physicist and Assistant to General Manager.

Laboratory Staff: Electronics 7, physicists 2, mathematicians 2, draftsmen 3, machine shop 3, mechanical technicians 3, photographer 1, research pilot 1.

Recruiting Contact: Mr. Joseph MacDowall.

**BRITISH AMERICAN RESEARCH AND
DEVELOPMENT COMPANY**
(Division of the British American Oil Company)
2489 North Sheridan Way, Sheridan Park, Ontario.

CANADA PACKERS, LIMITED
95 St. Clair Avenue, West, Toronto 7, Ontario.

President: W. F. McLean.

Fields of Interest: (1) Full line of meat products manufactured in plants across Canada; (2) Edible oil products — shortening, margarine, frying fat, salad oil; (3) Feeds for poultry, swine, beef and dairy animals;

INDUSTRIAL RESEARCH FACILITIES

- (4) Fine chemicals, pharmaceuticals, fatty acids, gelatin; (5) Leather;
- (6) Poultry products, cheese and miscellaneous.

Major Activity of Company: Mfg.

Research Facilities: The research facilities are located at 2211 St. Clair Avenue, West, Toronto 9, Ontario. These include 40,000 sq. ft. of laboratory space plus pilot plant facilities in oils, meats and fine chemicals. A library, taste-panel area, animal rooms and other specialized facilities are provided.

Research Personnel: Leon J. Rubin, Director of Research; H. W. Barnett, Assistant Director of Research; P. Ziegler, Assistant Director of Research; G. W. Burgess, Laboratory Administrator; R. G. Donovan, Group Leader, Leather; T. F. Massiah, Group Leader, Chemical Development; F. M. Misiak, Librarian; H. R. Nordin, Group Leader, Meats; C. H. Perrin, Group Leader, Analysis Research; B. F. Teasdale, Group Leader, Oils; B. VanBinnendyk, Statistics; R. Witty, Group Leader, Biochemistry.

Recruiting Contact: W. G. Burgess, Laboratory Administrator.

CANADIAN CANNERS, LIMITED

44 Hughson Street South, Hamilton, Ontario.

President: L. H. Johnston.

Fields of Interest: Processed fruits and vegetables, soups, catsup, pickles, jellies, marmalade, glace fruit, other food specialties, and can manufacturing.

Major Activity of Company: Mfg. 100%.

Research Facilities: Completely equipped Food Research Laboratory.

Research Personnel: C. J. Ross, Research Manager.

Laboratory Staff: Chemists 7, microbiologists 3, technicians 7, other 4.

Recruiting Contact: R. G. Teasdale, Industrial Relations Manager.

CANADIAN GAS ASSOCIATION

55 Scarsdale Road, Don Mills, Ontario.

Managing Director: Mr. W. H. Dalton.

Fields of Interest: Certification and testing laboratories, sponsorship of fuel

INDUSTRIAL RESEARCH FACILITIES

fired appliance standards, research and development for the gas industry.

Major Activity of Company: R&D 15%, Testing and Evaluation 65%, Other 20%.

Research Facilities: Complete testing facilities for gas, oil and electrical appliances and accessories.

Research Personnel: H. Wank, Director, Laboratories and Engineering. R. L. Hay, Chief Engineer.

Laboratory Staff: Professional engineers 3, engineering technologists 3, technologists 3, technicians 10, other 4.

Recruiting Contact: Director, Laboratories and Engineering.

CANADIAN GENERAL ELECTRIC COMPANY, LIMITED
214 King Street West, Toronto 1, Ontario.

President: J. H. Smith.

Major Activity of Company: R&D 7%, Other 93%.

Research Facilities: Facilities are decentralized and contiguous to manufacturing plants. The character and size of each facility is governed by the nature and type of products associated with each plant and its growth objectives.

Recruiting Contact: H. E. J. Holloway, Manager Engineering and Scientific Recruitment.

CANADIAN STRUCTURAL CLAY ASSOCIATION
4824 Yonge Street, Willowdale, Ontario.

CANADIAN WESTINGHOUSE COMPANY, LIMITED
Box 510, Hamilton, Ontario.

President: W. J. Cheesman.

Fields of Interest: Electrical and electronic equipment, air brakes, hydraulic drives, etc.

Major Activity of Company: Mfg. 98%, R&D 2%.

Research Facilities: Central research and development labs, with chemical,

INDUSTRIAL RESEARCH FACILITIES

electrical, metallurgical and mechanical section. Electronics, divisional labs. Other divisional development labs.

Research Personnel: R. O. Morse, Manager, Research and Development Laboratories; W. A. Pieczonka, Manager, Solid State Section.

Laboratory Staff: Engineers and scientists 40, technicians 42, others 16.

Recruiting Contact: Mrs. I. Watson.

CHAMPLAIN POWER PRODUCTS, LIMITED 951 Martin Grove Road, Rexdale, Ontario.

CHEMICAL PROJECTS, LIMITED 36 Greensboro Drive, Rexdale, Ontario.

President: Dr. Louis A. Pogorski.

Fields of Interest: Research and development in cryogenics, isotope analysis and separation, air pollution, geochemistry, explosives, trace gas analysis, gas purification. Generation of design data, technical and economic feasibility studies, development and fabrication of special instruments and equipment, geochemical and pollution surveys.

Research Facilities: 10,000 sq. ft. research laboratory consisting of analytical lab, physico-chemical lab, chemistry lab, instrument and electronics lab, chemical engineering lab, machine and fabrication shop. Equipment includes mass spectrometer, trace gas analyzer, chromatographs, synthesis trains, reactors, distillation and adsorption units, fully equipped machine shop, etc. Field testing facilities.

Research Personnel: Dr. L. A. Pogorski, Research Director; Dr. C. C. Chan, Mass Spectrometry; P. Williams, Physical Chemistry; E. Reimer, Geophysics; Dr. G. Galdi, Chemistry.

Laboratory Staff: Chemical engineers 1, mechanical engineers 1, physical chemists 1, chemists 2, geophysicists 1, technicians 6, other staff 10.

Recruiting Contact: B. Girard.

COMINCO LIMITED 630 Dorchester Boulevard, West, Montreal 2, Quebec.

INDUSTRIAL RESEARCH FACILITIES

COMPUTING DEVICES OF CANADA, LIMITED
P.O. Box 508, Ottawa 4, Ontario.

President: Mr. J. F. Taylor.

Fields of Interest: Research and Development. Products — Air and marine navigation, oceanics, ASW, photo optical, telecommunications, digital computer, industrial and scientific systems design, development and management; aerospace research; survey and exploration, field engineering, installation and maintenance services.

Major Activity of Company: Mfg. 64%, R&D 23%, Testing and Evaluation 10%, Consulting 3%.

Research Facilities: R&D building 65,000 sq. ft., 0.5 and 65" hypervelocity light gas guns (high vacuum) 4" smooth bore conventional gun, high-g electronics assemble and test laboratory 16" and 5" vertical launch guns (HARP) Sigma 7 and IBM 360 computers.

Research Personnel: R. R. Hoge, Vice-President, Engineering; G. P. T. Wilenius, Vice-President, Marketing; I. J. Irvine, R. Montgomery, R. S. Gruno, T. F. Potts, J. R. B. Murphy.

Laboratory Staff: Mechanical engineers 2, physicists 2, mathematician 1, instrument technicians 2, mechanical technician 1.

Recruiting Contact: R. R. Hoge, Vice-President, Engineering.

DENVER LABORATORIES (CANADA), LIMITED

L. D. CRAIG, LIMITED
Bell Craig Laboratories for Medical Research.
451 Alliance Avenue, Toronto 9, Ontario.

President: Mr. Carleton Ashley.

Fields of Interest: Effect of proteolytic enzymes on the gastro-intestinal absorption, tissue penetration and pharmacological activity of drugs.

Research Facilities: Complete facilities for biological and chemical research and analysis.

Research Personnel: Dr. A. Wohlman, Director; M. Syed, R. Ramírez.

Laboratory Staff: Technicians 2.

Recruiting Contact: Dr. A. Wohlman, Director of Research.

INDUSTRIAL RESEARCH FACILITIES

DESITRON COMPANY LIMITED

198 Hymus Road, Scarborough, Ontario.

President: Mr. Folke A. Walther.

Fields of Interest: Industrial heating and drying of microwave miniaturization of certain components.

Major Activity of Company: Mfg. 70%, R&D 15%, T&E 10%, Consulting 5%.

Research Facilities: Low Power Test Facilities from 1 GC-24 GC 5KW CW Tests in Heating region.

Research Personnel: G. Zelinger, B.A.Sc.

Laboratory Staff: Draftsman 1, technician 1.

Recruiting Contact: W. B. Scott, General Manager.

DILWORTH, SECORD, MEAGHER AND ASSOCIATES, LIMITED

4195 Dundas Street, West, Toronto 18, Ontario.

President: P. B. Dilworth.

Fields of Interest: All phases of engineering, analysis, design, supervision, development, testing and research. Specialty areas include aeronautical, nuclear and industrial engineering with emphasis upon the design of research facilities and specialized mechanical equipment. Research activities are concentrated in the same general areas.

Major Activity of Company: R&D 20%, Consulting 80%.

Research Facilities: IBM 1130 computer. R&D laboratory includes variety of special test equipment and rigs and an industrial wind tunnel. Supporting services include general purpose instrumentation and test equipment, electronics laboratory, machine shop, etc.

Research Personnel: R. P. Bell, I. J. Billington, G. F. Bremner, W. S. Brown, R. Coladipietro, G. W. S. Gordon, H. Goulding, M. L. Nixon, J. A. Rayfield, V. Smilnieks, J. Stambolich, L. J. P. Fillson.

Laboratory Staff: Supervisor, technologists 6 and supporting staff.

INDUSTRIAL RESEARCH FACILITIES

DOMTAR, LIMITED

Research Centre, Senneville, Quebec.

President: Mr. T. N. Beaupré.

Fields of Interest: Pulp and paper — a diversified line of pulp and paper products including newsprint, fine papers, cartons, plastics, etc., chemicals, coal tar products, lime, salt, synthetic detergents, metal powders and wood preservatives. Building materials: bricks, roofing materials, lightweight concrete, fibre products, gypsum and lumber.

Major Activity of Company: Mfg. 100%.

Research Facilities: Domtar Research Centre, consisting of laboratories and pilot plant, located at Senneville, Quebec (suburb of Montreal).

Research Personnel: Dr. G. H. Tomlinson, Research Director; Dr. H. B. Marshall, Associate Research Director; Mr. A. M. Irvine, Head, Administration; Dr. O. L. Forgacs, Head, Pulp and Paper and Allied Building Products Section; Mr. N. C. Hauffe, Acting Head, Wood and Logging Section; Dr. E. J. Tarlton, Head, Chemicals and Allied Products Section; Dr. D. J. Whittle, Head, Engineering and Development Section.

Laboratory Staff: Professional 60, technical 68, administrative 14.

Recruiting Contact: Dr. H. B. Marshall, Associate Research Director.

DOW CHEMICAL OF CANADA, LIMITED

Sarnia, Ontario.

President: L. D. Smithers.

Fields of Interest: Manufacture of chemicals, plastics and pharmaceuticals.

Research Facilities: Well equipped laboratories at Sarnia and Edmonton for research, development and testing.

Research Personnel: B. B. Hillary, Research Manager; H. W. Quinn, Assistant Research Manager; D. M. Young, Assistant Research Manager.

Recruiting Contact: W. H. White, Industrial Relations.

DUNLOP RESEARCH CENTRE

Sheridan Park, Ontario.

INDUSTRIAL RESEARCH FACILITIES

DUPULATE CANADA LIMITED

First Avenue, Oshawa, Ontario.

President: Mr. D. S. Chant.

Fields of Interest: Automotive safety glass, electronic ceramic materials, (i.e., substrates and ferroelectric ceramic materials).

Research Facilities: Commercially available facilities include physical testing machines, spectrophotometers, optical and electron microscopes, and lasers. Special equipment is built as required.

Research Personnel: Dr. S. Bateson, Director of Research; Mr. J. W. Hunt, Research Laboratory Manager.

Laboratory Staff: Physicists 5, chemists 2, technicians 11.

Recruiting Contact: Mr. G. A. Hines.

EDO (CANADA) LIMITED

P.O. Box 97, Cornwall, Ontario.

President: H. M. Johnson.

Fields of Interest: Underwater sonar systems, depth sounders, hydrophones.

Major Activity of Company: Mfg. 95%, R&D 2%, T&E 3%.

Research Facilities: Piezo-electric crystals, growing facilities for water soluble materials. Studies of the properties for electro-mechanical and electro-optical applications.

Research Personnel: R. S. Adhav, Ph.D., Director of Research.

Laboratory Staff: Electric technologist 1, research technician 1.

Recruiting Contact: Manager of Engineering.

ELDORADO NUCLEAR LIMITED

151 Slater Street, Ottawa, Ontario.

President: Mr. W. M. Gilchrist.

Fields of Interest: Uranium mining, milling and refining Zirconium production.

Major Activity of Company: R&D 5%, Mining and Refining 95%.

Research Facilities: Metallurgical Laboratory at Ottawa, Ontario; Research

INDUSTRIAL RESEARCH FACILITIES

and Development Group at Port Hope, Ontario; Mill Testing Laboratory at Eldorado, Saskatchewan.

Research Personnel: Gordon F. Colborne, Manager, R&D; Frank W. Melvanin, Superintendent, New Product Development; John M. Jardine, Laboratory Superintendent; J. Laurie Hart, Assistant Superintendent, Laboratories.

Laboratory Staff: Chemists and chemical engineers 12, metallurgists and metallurgical engineers 5, civil engineer 1, laboratory technicians 28, secretarial and library personnel 4.

Recruiting Contact: G. F. Colborne, Manager, R&D Division.

ELECTRIC REDUCTION COMPANY OF CANADA LIMITED

155 Etobicoke Drive, Islington, Ontario.

President: Lloyd G. Lillico.

Fields of Interest: Elemental phosphorus and various industrial phosphates, notably sodium tripolyphosphate. Phosphatic fertilizers and feed supplements. Chemicals used in the pulp and paper industry, notably sodium chlorate and chlorine dioxide.

Major Activity of Company: Mfg. 100%.

Research Facilities: Approximately 12,000 sq. ft. of laboratory and pilot plant space located at 155 Etobicoke Drive, Islington.

Research Personnel: E. J. Bissaillon, Vice-President and Manager, Technical Division; R. M. O. Maunsell, Senior Technical Advisor to the President; J. D. McGilvery, Manager, Research and Development Laboratories; A. B. Foster, Manager, Research Department; G. E. Tafler, Manager, Process Development Department; H. Freedman, Manager, Pulp and Paper Research.

Laboratory Staff: Chemists 4, engineers 1, technicians 11, other 2.

Recruiting Contact: C. P. Quinn.

ESCOTT BUILDING CORPORATION LIMITED

Suite 15, 3625 Weston Road, Weston, Ontario.

President: George K. Escott, P.Eng.

Fields of Interest: Design, fabrication, erection, methodology in respect to prefabrication of building components.

Major Activity of Company: R&D 40%, Testing and Evaluation 10%, Consulting 50%.

Research Facilities: Library. Shop and equipment for process study and

INDUSTRIAL RESEARCH FACILITIES

evaluation, access to and liaison with nearby commercial testing laboratories.

Research Personnel: George K. Escott, P.Eng.

Laboratory Staff: As required.

Recruiting Contact: George K. Escott, P.Eng.

FERRANTI-PACKARD ELECTRIC LIMITED

121 Industry Street, Toronto 15, Ontario.

President: Mr. T. Edmondson.

Fields of Interest: Power distribution and metering transformers. Electricity meters. Digital electronic equipment peripherals: especially optical scanners, paper tape handling, ambient light displays. Numerical control machining and digital electronic gauging. Computer included systems for industrial and military purposes. Avionic equipment (military). Super conducting magnets.

Major Activity of Company: Mfg. 95%, R&D 5%.

Research Facilities: Dielectric phenomena in oil impregnated paper structures. Acoustic studies on power transformer noise (Power Division Laboratory). Digital electronics — Electrochemical energy converters (Fuel Cells etc.). Superconductivity Laboratory. Electromechanical development laboratory.

Recruiting Contact: R. M. MacDougall.

FIBERGLAS CANADA LIMITED

HEAD OFFICE: 48 St. Clair Avenue, West, Toronto 7, Ontario.

PLANTS: Insulation — Sarnia, Ontario; Edmonton, Alberta; Montreal, P.Q. Textile — Guelph, Ontario.

President: Mr. A. J. Fisher.

Fields of Interest: Research and development in the area of fibrous composite materials (glass and other fibres, bonding materials, reinforced composites).

Major Activity of Company: Mfg. 97%, R&D 1.5%, T&E .5%, Other 1%.

Research Facilities: Technical Centre, Sarnia, Ontario.

Research Personnel: Mr. K. P. Gladney, B.Sc. (Chem. Eng.), Manager; Dr. F. W. Maine, Manager, Materials Research and Development.

Laboratory Staff: R&D professionals 10, R&D technicians 9, product evaluators and service professionals 4, product evaluators and service technicians 6.

Recruiting Contact: Mr. D. A. Wallace, Manager, Industrial Relations.

INDUSTRIAL RESEARCH FACILITIES

FLUID POWER LIMITED

282 Belfield Road, Rexdale, Ontario.

President: W. L. Hutchison.

Fields of Interest: Hydraulic controls and systems, fluidics, seals, filament winding, hydraulic deceleration.

Major Activity of Company: Mfg. 95%, R&D 5%.

Research Facilities: New laboratory in process of being established with complete capability for experimentation testing and measuring in high pressure hydraulics.

Research Personnel: Dr. E. Davison, Director of Research; P. M. Chambers, Research Engineer.

Laboratory Staff: Technician 1.

Recruiting Contact: Mr. W. L. Hutchison.

GARRETT MANUFACTURING LIMITED

255 Attwell Drive, Rexdale, Ontario.

Vice-President: Mr. W. C. Tate.

Fields of Interest: Temperature control systems, static inverters, radio emergency beacons and downed aircraft locators, pneumatic signal generators, hybrid micro circuits and precision thin film resistor elements. Garrett marine products — automatic mooring wench, towing machine, self propelled vehicle.

Major Activity of Company: Mfg. 73%, R&D 15%, Testing and Evaluation 2%, Other 10%

Research Personnel: R. J. Richardson, B. W. Atkinson, C. D. Hickling, G. W. Rose, R. S. Sennett, H. A. Bisset, T. Tamagi, A. Gahunia, S. Zutrauen, R. Marshall, R. Mitchell, A. Wesolowski, M. Bernard, C. Prince, P. Gill, P. Kershaw, A. Vindasius, J. Cameron, L. Pytel.

Laboratory Staff: Chief of Engineering Services 1, environmental test supervisor 1, engineer associate 1, technicians — electrical-mechanical 4, supervisor of engineering support 1.

Recruiting Contact: Mr. M. E. White, Industrial Relations Manager.

INDUSTRIAL RESEARCH FACILITIES

GENERAL CONCRETE LIMITED

Highway 20 and Q.E. Way, Box 46, Station "C", Hamilton, Ontario.

President: P. J. Pennachetti.

Fields of Interest: Concrete technology; cement technology; adhesives used in building construction; concrete finishes — organic and inorganic.

Major Activity of Company: Mfg. 90%, R&D 5%, Testing and Evaluation 5%.

Research Facilities: Fully equipped concrete and cement testing and research laboratory.

Research Personnel: J. T. Pennachetti, Board Chairman; J. F. Boux, Chief Engineer; D. Gray, Quality Control Superintendent.

Laboratory Staff: Research assistants, quality control 2.

Recruiting Contact: J. E. Gammage, Executive Assistant.

GENERAL FOODS, LIMITED

2200 Yonge Street, Toronto 12, Ontario.

President: R. S. Hurlbut.

Fields of Interest: R&D in areas of dry food product mixes, flavours, fats and oils, frozen food products, chemistry of coffee and coffee processing, cereal and pet food technology, microbiology and sensory evaluation methodology.

Major Activity of Company: Mfg. R&D (internal).

Research Facilities: Laboratory and pilot plant located at Cobourg, Ontario and LaSalle, Quebec.

Research Personnel: W. R. Mason, FCIC, Manager of Research and Engineering; Dr. T. A. Watts, Research Manager; K. M. Torrie, Laboratory Manager, 520 William Street, Cobourg, Ontario; W. R. Waring, Laboratory Manager, 795 - 90th Avenue, LaSalle, P.Q.

Laboratory Staff: Chemistry 12, food science 3, chemical engineering 6, dairy science 1, microbiology 3, mathematics 1, biological engineering 1, other laboratory staff 26.

Recruiting Contact: T. A. Watts.

INDUSTRIAL RESEARCH FACILITIES

GEOPHYSICAL ENGINEERING & SURVEYS, LIMITED

Box 49, Toronto-Dominion Centre, Toronto, Ontario.

President: N. B. Keevil, Jr.

Fields of Interest: Minerals exploration, using geologic, geophysical and geochemical techniques. Airborne electromagnetics: research with Barringer Research Limited. Airborne gamma-ray spectroscopy: research with McPhar Geophysics Limited.

Major Activity of Company: R&D 10%, Testing and Evaluation 10%, Consulting 80%.

Research Facilities: Small all-wood building for electromagnetic experiments. Office space in Toronto-Dominion Centre for computer programming for data reduction and interpretation.

Research Personnel: D. C. Fraser, Ph.D.

Laboratory Staff: Technologist-electronic 1, technologist-electronic in training 1.

Recruiting Contact: M. M. Steiner.

THE GLIDDEN COMPANY LIMITED

351 Wallace Avenue, Toronto 9, Ontario.

President: Mr. J. W. Fowler — Vice-President and Managing Director.

Fields of Interest: Surface coatings, resins, latices, plastisols, adhesives.

Major Activity of Company: Mfg. 100%.

Research Facilities: 12,000 sq. ft. laboratory area, analytical laboratory, testing equipment.

Research Personnel: F. L. Steele, Technical Director; G. G. Davis, Research Chemist; E. Turpin, Research Chemist.

Laboratory Staff: About 30 chemists, engineers and technicians.

Recruiting Contact: Mr. W. E. Lennox.

W. R. GRACE & COMPANY OF CANADA LIMITED

Cryovac Limited, 2365 Dixie Road, North, Mississauga, Ontario.

President: Mr. J. F. Holbrook.

Fields of Interest: Plastic food packaging, saran, polypropylene, irradiated

INDUSTRIAL RESEARCH FACILITIES

polyolefins films, laminations, oriented polystyrene sheet and containers foamed polystyrene sheet and containers packaging machinery.

Major Activity of Company: Mfg. 97%, R&D 3%.

Research Facilities: Irradiation facility (electron beam).

Research Personnel: R. A. Bolton, B.Sc., M.Sc.; C. M. Lulham, B.Sc.; S. Tooke, Ph.D.; J. M. Holmboe, B.A.Sc.; D. G. Wallwork, B.Eng.; W. V. Saunders, B.Sc.

Laboratory Staff: Chemist and quality control 1, laboratory supervisor-chemistry 1, chief technician 1.

Recruiting Contact: Mr. W. P. Kelly, B.A.

HUNTEC LIMITED

1450 O'Connor Drive, Toronto 16, Ontario.

President: Dr. Norman R. Paterson.

Fields of Interest: Earth Sciences includes — applied geophysics, exploration geophysics, engineering geophysics, oceanology, marine geophysics, instrumentation development design and manufacturers.

Major Activity of Company: Mfg. 30%, R&D 15%, Consulting 55%.

Research Facilities: One 20 ton research vessel based on Great Lakes.

Research Personnel: Mr. R. Hutchins, Mr. H. Reddering, Dr. F. Grant, Dr. A. Spector.

Laboratory Staff: Physicists 2, mathematicians 2, technicians 12, engineers 2.

Recruiting Contact: Universities.

IBM COMPANY LIMITED

1150 Eglinton Avenue, East, Don Mills, Ontario.

President: Mr. J. E. Brent.

Fields of Interest: Data processing systems and supplies; office products and supplies; offset duplicating equipment; micro processing equipment; and, cold-typesetting equipment.

Major Activity of Company: Mfg., R&D, Testing and Evaluation, Consulting and Marketing.

Research Facilities: Facilities located on the site of the Company Headquarters in Don Mills, Ontario.

Research Personnel: B. B. Goodfellow, Manager, IBM Canada, Laboratory.

Recruiting Contact: B. B. Goodfellow, Manager, IBM Canada, Laboratory.

INDUSTRIAL RESEARCH FACILITIES

IMPERIAL OIL ENTERPRISES LIMITED

Research Department, P.O. Box 3022, Sarnia, Ontario.

President: W. O. Twaits.

Fields of Interest: Petroleum — processes and products. Petrochemicals — raw materials, intermediates, plastics, additives. Plastics.

Research Facilities: Approximately 120,000 sq. ft. of laboratory, pilot plant and engine test facilities with all necessary modern equipment and analytical tools. Also in Sarnia is the Plastics Application Laboratory in which part of the function is application research. An associated laboratory in Montreal does research on building products and there are producing and exploration labs in Calgary.

Research Personnel: Dr. G. W. Gurd, Manager; Dr. C. H. Caesar, Deputy Manager; Mr. R. B. Berkoff, Manager, Operations Division; Dr. C. T. Steele, Manager, Chemicals Division; Mr. J. L. Tiedje, Manager, Petroleum Division.

Laboratory Staff: Professionals 75, supporting staff 170.

Recruiting Contact: Dr. C. H. Caesar.

INTERNATIONAL CELLULOSE RESEARCH LIMITED

Hawkesbury, Ontario.

President: Mr. Geoffrey D. Hughson.

Fields of Interest: R&D in fields of pulping, bleaching, papermaking, wood chemistry, by-products, etc., related to the manufacture of newsprint, kraft paper and board, dissolving pulp, building products and other products of the parent company, Canadian International Paper Company.

Major Activity of Company: R&D 94%, Testing and Evaluation 6% for parent company, Canadian International Paper Company.

Research Facilities: Laboratories for applied and fundamental research, and pilot plants for pulping, bleaching and end product evaluation in Hawkesbury; pilot plants for pulping and papermaking in Gatineau, Quebec.

Research Personnel: F. R. Charles, Vice-President and Director of Research; W. B. Cranford, Manager, Process Development Division;

INDUSTRIAL RESEARCH FACILITIES

E. J. Howard, Consulting Research Director; Dr. D. B. Mutton, Director, Basic Research and Special Services; D. T. Roy, Manager, Gatineau Division.

Laboratory Staff: Chemists 31, chemical engineers 26, physicists 2, botanists 3, mechanical engineers 3, technicians 126, others 34; total 225.

Recruiting Contact: Mr. F. R. Charles, Vice-President and Director of Research.

JOHNSON MATTHEY & MALLORY LIMITED 110 Industry Street, Toronto 15, Ontario.

President: J. E. Shirreff.

Fields of Interest: Tantalum and aluminum electrolytic capacitors, precious metals and alloys, timer switches, welding products, brazing materials, noble metal catalysts.

Major Activity of Company: Mfg.

Research Facilities: The Research and Development Laboratory is located in the plant at 110 Industry Street.

Research Personnel: P. L. Bourgault, Ph.D.; G. H. Fraser, Ph.D.; R. E. Ranford, M.A.Sc.; J. Batelaan, B.A.Sc.

Laboratory Staff: Technologists 3.

Recruiting Contact: P. L. Bourgault.

JOHN LABATT LIMITED 150 Simcoe Street, London, Ontario.

President: J. H. Moore.

Fields of Interest: Beer and ale, wines, flour, starch, gluten, packaged foods, food and feed supplements, fine chemicals.

Major Activity of Company: Mfg. 100%.

Research Facilities: Animal Science Laboratories — London, Ontario. Experimental Farm — Putnam, Ontario. Beverage Science Laboratories — London, Ontario. Food Technology Laboratories — Mon-

INDUSTRIAL RESEARCH FACILITIES

treal, Quebec. Microbiological Science Laboratories — London, Ontario. Organic Chemistry Laboratories — Montreal, Quebec.

Research Personnel: Dr. I. R. Sibbald, Director of Animal Science; Dr. B. Shelton, Manager of Beverage Science; Dr. J. Holme, Director of Research (Food, Starch, Gluten); J. W. Barlow, Director of Product Development (Packaged Foods); Dr. M. F. Walmsley, Director of Microbiological Science; Dr. C. Podesva, Director of Research (Organic Chemistry).

Laboratory Staff: Scientists 31, technicians 46.

Recruiting Contact: Mr. D. G. Veale.

LECO INDUSTRIES LIMITED

70 Barbados Boulevard, Scarborough, Ontario.

President: Mr. W. E. Lynes.

Fields of Interest: Research and development of novel plastic films for the food and industrial packaging industry.

Major Activity of Company: Mfg. 100%.

Research Facilities: Laboratory for manufacture and evaluation of experimental plastic films.

Research Personnel: Dr. Warren Baker.

Laboratory Staff: Engineers 2, technicians 3.

Recruiting Contact: Dr. Warren Baker.

LEIGH INSTRUMENTS LIMITED

P.O. Box 820, Carleton Place, Ontario.

President: J. J. Shepherd.

Fields of Interest: Aircraft location and recording systems including airfoil delivery, crash position indicator and data recording systems; aircraft instruments including automatic master heading control, servo repeater amplifier and servoed altimeters; commercial products including forestry survey altimeter, fluoride analyzer, and oxygen probe are currently in production or under development.

Major Activity of Company: Mfg. 75%, R&D 15%, T&E 10%.

Research Facilities: The environmental laboratory contains six AGREE temperature chambers, each fitted with vibration machines, one large

INDUSTRIAL RESEARCH FACILITIES

temperature altitude chamber and two high frequency vibration machines. Aeronautics, recorder and instrument development facilities are available.

Research Personnel: J. R. B. Steacie, Vice-President, Director of Engineering; M. Price, Manager, Commercial Products; G. Dimock, Assistant to Director of Engineering; J. R. Williams, Chief Engineer (Crash Position Indicator/Recorder Group); H. Aass, Engineering Manager, Aeronautics Development Group; G. Ireland, Group Engineer, Instrumentation Group.

Laboratory Staff: Engineers and technicians 100.

Recruiting Contact: J. R. B. Steacie, Vice-President, Director of Engineering.

ERNST LEITZ (CANADA) LIMITED 122 Ellen Street, Midland, Ontario.

President: Mr. Guenther Leitz.

Fields of Interest: Geometric optics with emphasis on photography; Optical Instruments with emphasis on fire control; Gaslasers and accessories; Interferometry.

Major Activity of Company: Mfg. 80%, R&D 10%, T&E 10%.

Research Facilities: IBM 1130 Computer; SIRA-Beck Modulation-Transfer-Analyzer; Interferometers, Spectrometers, Optical benches.

Names of Research Personnel: W. Mandler, Dipl.-Phys.; J. Consitt, M.A.; T. Malinowski, Opt.Eng.; B. Munro, B.A.

Laboratory Staff: Optical designers 2, laboratory assistant 1.

LEVER BROTHERS LIMITED 1 Sunlight Park Road, Toronto 8, Ontario.

President: John C. Lockwood.

Fields of Interest: Manufacturing and marketing of soaps, detergents, toiletries, edible fats and oils and wax polishes. Research and development of new and improved consumer and industrial products.

Major Activity of Company: Mfg. 50%, R&D 5%, Testing & Evaluation 5%, Other 40%.

Research Personnel: Stanley O. Winthrop, Director of Research and

INDUSTRIAL RESEARCH FACILITIES

Development; Keith Clark, Research Manager; Charlie O'Sullivan, Research Manager.

Laboratory Staff: Chemists 12, Chemical engineers 6, technicians 14, other lab staff 4.

Recruiting Contact: Ed. MacKay, Personnel Department.

LITTON SYSTEMS (CANADA) LIMITED (LITTON INDUSTRIES)
25 Cityview Drive, Rexdale, Ontario.

President: J. M. Bridgman.

Fields of Interest: Airborne navigation systems; tactical data systems; bombing computer systems; aerospace ground equipment; commercial special purpose control systems.

Major Activity of Company: Mfg. 75%, R&D 10%, T&E 5%, Other 10%.

Research Facilities: 10,000 square feet.

Research Personnel: Dr. J. J. Green, Director of Research; L. A. Borth, Director of Engineering.

Laboratory Staff: Engineers 30, technicians 50.

Recruiting Contact: Dr. J. J. Green.

M & T PRODUCTS OF CANADA LIMITED

670 Strathearne Avenue, North, Box 211, Station "C", Hamilton, Ontario.

President: Mr. C. J. Beasley.

Fields of Interest: Tin Chemistry.

Major Activity of Company: Mfg. 95%, R&D 5%.

Research Facilities: Completely equipped laboratory.

Research Personnel: R. D. Fraser, Vice-President and General Manager; P. D. Goulden, Research Director.

Laboratory Staff: Chemical engineer 1, chemist 1, technicians 3.

Recruiting Contact: P. D. Goulden.

INDUSTRIAL RESEARCH FACILITIES

MALLORY BATTERY COMPANY OF CANADA LIMITED
2333 North Sheridan Way, Sheridan Park, Ontario.

President: Mr. K. R. Brands.

Fields of Interest: Primary and secondary alkaline dry cells; high energy density power sources; research and development of power sources for special operating conditions.

Major Activity of Company: Mfg. 95%, R&D 5%.

Research Facilities: Power sources laboratory with facilities for research on electrochemical, powder technology, and metallurgical aspects of electrochemical power generation.

Research Personnel: Dr. F. J. Kelly, Manager, Research; Dr. F. Przybyla, Research Scientist.

Laboratory Staff: Scientists 2, technologists 2, technicians 4.

Recruiting Contact: Dr. F. J. Kelly.

MAPLE LEAF MILLS LIMITED

417 Queen's Quay West, Toronto 2B, Ontario.

President: G. M. MacLachlan.

Fields of Interest: Animal feeds, grain, flour, baking grocery products, vegetable oils, resins.

Research Facilities: Research laboratory and research farm.

Research Personnel: W. H. Hoffman, Director of Research. W. D. Morrison, Director, Nutrition and Research.

Laboratory Staff: Professionals 8, technicians 16.

Recruiting Contact: N. P. Vallieres, Director of Industrial Relations.

HOGG AND LYTLE SEEDS, DIVISION OF MAPLE LEAF MILLS LIMITED

Oakwood, Ontario.

Fields of Interest: Farm seeds and turf grass seeds, research projects: development of improved varieties hybrid corn and forages.

Research Facilities: Land and equipment at: Crop Research Centre, Maple Leaf Mills Limited, R.R. #2, Georgetown, Ontario, and; Crop Re-

INDUSTRIAL RESEARCH FACILITIES

search Station, Maple Leaf Mills Limited, P.O. Box 9, Wallaceburg, Ontario.

Research Personnel: Dr. W. E. Sieveking, Director, Crop Research. Jiri Jacubec, Technician. John Heatherington, Technician.

Recruiting Contact: T. Szego, General Manager, Hogg & Lytle Seeds, Oakwood, Ontario.

MARSLAND ENGINEERING LIMITED

350 Weber Street, North, Waterloo, Ontario.

President: Stanley Marsland.

Fields of Interest: 1) Electro-mechanical-optical displays and recorders; meteorological instrumentation (visibility measuring devices, etc.); audio equipment; components (loudspeakers and transformers); ordnance items (mechanical and electronic fusing).

Major Activity of Company: Mfg. 90%, R&D 10%.

Research Facilities: Electronics laboratories, mechanical, environmental, photographic laboratories, engineering, drafting, in excess of 15,000 square feet.

Research Personnel: F. D. Leeson, Chief Development Engineer. A. S. Armstrong, W. Doran, F. Moritz, B. Fairey, G. Moogk, W. Walker, J. Conner, P. Ridout, L. Phillips.

Laboratory Staff: Environmental engineer 1, development engineers 2, systems engineers 3, electrical technician 1, electro-mechanical engineer 1, electronic engineers 4, chemical engineers 1, draughtsmen 6, technical writing staff 4.

Recruiting Contact: Personnel Manager, W. Marsland.

NORTHERN ELECTRIC RESEARCH AND DEVELOPMENT LABORATORIES

P.O. Box 3511, Station "C", Ottawa, Ontario

President: V. O. Marquez.

Fields of Interest: Telecommunications equipment, solid state, technology and electronics.

Major Activity of Company: Mfg. 95%, R&D 5%.

INDUSTRIAL RESEARCH FACILITIES

Research Facilities: Central laboratories in Ottawa and six regional laboratories in other Canadian centres.

Research Personnel: W. R. Johnston, Vice-President. Dr. F. S. Eadie, Director, Research.

Laboratory Staff: Engineers 500, technologists 500.

Recruiting Contact: V. H. Earle, Personnel Superintendent.

NORTHERN RADIO MANUFACTURING COMPANY LIMITED 1950 Bank Street, Ottawa 10, Ontario.

President: Mr. J. G. Macmillan.

Fields of Interest: Data transmission and related fields.

Major Activity of Company: Mfg. 80%, R&D 20%.

Research Facilities: 1,000 square feet well equipped lab for our fields of endeavour.

Research Personnel: A. W. Y. DesBrisay, PhD., Chief Engineer.

Laboratory Staff: Engineers 3, technicians 3, draughtsman 1, secretary 1.

Recruiting Contact: J. G. Macmillan, President.

NORTON RESEARCH CORPORATION (CANADA) LIMITED P.O. Box 690, Chippawa, Ontario.

President: Mr. John Jeppson.

Fields of Interest: Development of new businesses through technical innovations, particularly in the fields of abrasives, refractories, electronics, and high temperature technology (1500-2800°C).

Major Activity of Company: R&D 75%, Testing and Evaluation 20%. Consulting 5%.

Research Facilities: Modern laboratories for R&D on electronic materials and devices, abrasives, and refractories, including analytical, X-ray and microscopic labs. Pilot plant facilities for projects involving arc

INDUSTRIAL RESEARCH FACILITIES

furnaces, high frequency furnace, chemical and/or ceramic engineering processes.

Research Personnel: Dr. A. F. McKay, Vice-President and Managing Director. Dr. G. L. Martin, Vice-President.

Laboratory Staff: Engineers — 8 chemical, 2 metallurgical, 2 electrical, 1 mechanical.

Scientists — 3 chemical, 1 physicist, 2 mineralogist, 1 geologist, technicians 30, other 10.

Recruiting Contact: Dr. A. F. McKay, Vice-President and Managing Director.

ORENDA LIMITED

Box 6001, Toronto International Airport, Malton, Ontario.

President: F. P. Mitchell.

Fields of Interest: Major Interest: gas turbine design and development. Secondary Interest: engineering services (Nuclear Products, Research, Development and Manufacture; Test Engineering, Experimental Manufacture and Commercial Testing Laboratories), Chemistry, Metallurgy, Welding and Instrument.

Major Activity of Company: Mfg. 90%, R&D 4%, Testing and Evaluation 6%.

Research Facilities: Complete testing laboratories including environmental facilities, prototype manufacture assembly and testing — total 45,000 square feet, Department of National Defence approval of most facilities.

Research Personnel: B. A. Avery, Director of Engineering. D. Caple, Engineering Operations Manager. H. N. Isaac, Engineering Services Manager (nuclear and testing).

Laboratory Staff: Engineers 30, laboratory specialists 6, laboratory technicians 50.

Recruiting Contact: Personnel Department.

INDUSTRIAL RESEARCH FACILITIES

PICKER X-RAY MANUFACTURE, LIMITED

26 Victoria Crescent, Bramalea, Ontario.

President: C. K. Bridgeman.

Fields of Interest: Medical X-ray equipment.

Major Activity of Company: Mfg. 50%, R&D 30%, Testing and Evaluation 20%.

Research Facilities: 4,000 square feet of mechanical and electrical laboratories.

Research Personnel: J. W. Smit, Chief Engineer, Glen C. Miller, Electronics Engineer.

Laboratory Staff: Engineering technologists 4.

Recruiting Contact: C. K. Bridgeman.

POLYMER CORPORATION LIMITED

Sarnia, Ontario.

President: Mr. E. Ralph Rowzee.

Fields of Interest: Manufacture of synthetic rubbers, latices, and associated polymers.

Major Activity of Company: Mfg. 96%, R&D 4%.

Research Facilities: Fully equipped laboratories and pilotplants for synthesis, evaluation and process development of company products.

Research Personnel: E. J. Buckler, Vice-President. L. A. McLeod, Manager of Research and Development. E. E. Gale, Manager, Market Development. R. A. Stewart, Manager, Latex Development. J. W. Hellman, Manager, Resins and Plastics Development.

Recruiting Contact: Mr. R. J. Clifford, Salaried Personnel Manager.

PRECISION ELECTRONIC COMPONENTS LIMITED

19 Hafis Road, Toronto 15, Ontario.

President: Mr. A. Simoni.

Fields of Interest: Manufacture of electronic components. Research to improve these components.

Major Activity of Company: Mfg. 80%, R&D 10%, T&E 10%.

Research Facilities: Complete environmental testings laboratory for electronic components. Chemical Laboratory.

Research Personnel: Ben Kates, Chemist. Ron Hanna, Research Engineer.

INDUSTRIAL RESEARCH FACILITIES

Leon Ginsberg, Product Engineer. Trinidad Pates, Chemical Technologist.

Laboratory Staff: Supervising technician 1, laboratory technician 1, laboratory assistant 1.

Recruiting Contact: Mr. A. Simoni.

THE PROCTER AND GAMBLE COMPANY OF CANADA, LIMITED

Burlington Street East, Hamilton, Ontario.

President: Mr. G. Williams, P&G Building, 2 St. Clair Avenue West, Toronto, Ontario.

Fields of Interest: Soaps and detergents, edible oils and shortenings, toilet goods.

Major Activity of Company: Manufacturing and marketing.

Research Facilities: Have laboratory and pilot plant facilities as well as administrative facilities for a staff of approximately 100 people.

Recruiting Contact: Mr. A. F. Howey. (Hamilton)

REICHHOLD CHEMICALS (CANADA) LIMITED

1919 Wilson Avenue, Weston, Ontario.

President: Mr. G. L. Hagen.

Fields of Interest: Synthetic resins for plastics, moulding adhesives, surface coatings and chemicals, such as formaldehyde.

Major Activity of Company: Mfg. 100%.

Research Facilities: Polymer research laboratories in Vancouver, B.C. and Toronto, Ontario.

Research Personnel: Dr. S. Kambanis, Dr. H. Kucharska, Dr. C. Rickard, Dr. R. C. Vasishth.

Recruiting Contact: Dr. R. C. Vasishth, Research Director.

RIO ALGOM MINES LIMITED (Mining Division)

Head Office, 120 Adelaide Street West, Toronto, Ontario.

President: Mr. R. D. Armstrong.

Fields of Interest: Applied research and development in recovery of metals

INDUSTRIAL RESEARCH FACILITIES

from ores and subsequent processing thereof. Also custom assaying and metallurgical testing, primarily for associated companies.

Major Activity of Company: Mfg. 70%, R&D 10%, Consulting 10%, Other Management Service 10%.

Research Facilities: Laboratories and pilot plants at Elliot Lake, Ontario.

Research Personnel: M. E. Grimes, Manager Research. J. W. Fisher, Research Superintendent. E. Barnes, Research Superintendent.

Laboratory Staff: Chemical engineers 3, metallurgical engineers 3, chemists 3, other lab staff 19.

Recruiting Contact: M. E. Grimes, Manager, Research.

ST. LAWRENCE STARCH COMPANY, LIMITED 141 Lakeshore Road East, Port Credit, Ontario.

SHERMAN AND ULSTER LIMITED (formerly, Empire Laboratories) 301 Lansdowne Avenue, Toronto, Ontario.

President: Dr. Bernard C. Sherman.

Fields of Interest: Research and development of fine chemical manufacturing processes.

Major Activity of Company: Mfg. 67%, R&D 15%, T&E 15%, Consulting 3%.

Research Facilities: Fully equipped chemical research laboratories and pilot plant.

Research Personnel: Frank M. Martin, Research Director and Plant Manager. William C. Thomas, Pilot Plant Supervisor. Anthony A. Raudon, Research Chemist.

Laboratory Staff: Chief chemist 1, chemists 4, technicians 8.

Recruiting Contact: Frank M. Martin, Research Director.

INDUSTRIAL RESEARCH FACILITIES

SINCLAIR RADIO LABORATORIES, LIMITED
122 Rayette Road, Maple, Ontario.

President: Professor G. Sinclair.

Fields of Interest: Antennas, filters, control systems, and associated hardware.

Major Activity of Company: Mfg. 75%, R&D 20%, Testing and Evaluation 3%, Consulting 2%.

Research Facilities: Antenna development and testing range aid laboratory, filter laboratory, intermodulation test bed.

Research Personnel: Dr. W. V. Tilston, Director of Research. I. A. Fraser, Engineering Manager. A. H. Secord, Senior Engineer. F. G. Buckles, Senior Engineer. G. Graham. J. Lainevoor. W. McGladdery.

Laboratory Staff: Technologists 6.

Recruiting Contact: I. A. Fraser, Engineering Manager.

SPAR AEROSPACE PRODUCTS LIMITED
Box 6022, Toronto International Airport, Malton, Ontario.

President: Mr. L. D. Clarke.

Fields of Interest: Research, design and development of antennas and booms for space craft, solid state power conditioning devices and electro optical systems.

Major Activity of Company: Mfg. 50%, R&D 20%, Testing and Evaluation 5%, Other 25%.

Research Facilities: Mechanical, electronic, and physics (electro-optical) and metallurgical laboratories.

Research Personnel: H. S. Kerr, Chief Engineer. H. R. Warren, Research Space Systems. K. Farrell, Research Space Antennas and Booms. T. Ussher, Research Power Conditioning.

Laboratory Staff: Mechanical 7, metallurgical 2, power conditioning 6, electro-optical 5.

Recruiting Contact: E. Nield, Director, Employee Relations.

INDUSTRIAL RESEARCH FACILITIES

SPARTON OF CANADA LIMITED

P.O. Box 2125, 100 Elm Street, London, Ontario.

President: N. C. Eiloart.

Fields of Interest: A.S.W. systems, particularly design and production of sonobuoy transmitters, receivers and hydrophones.

Major Activity of Company: Mfg. 90%, R&D and T&E 10%.

Research Facilities: Comprehensive electronic equipment to satisfy requirements in 4 above. Deep water and high pressure water environments.

Research Personnel: B. Graham, J. P. Chevalier, J. W. Maradyn.

Recruiting Contact: B. Graham.

SPRAGUE ELECTRIC OF CANADA LIMITED

10 Bertal Road, Toronto 15, Ontario.

STONE AND WEBSTER CANADA LIMITED

60 Adelaide Street East, Toronto 1, Ontario

President: R. S. Boyd.

Fields of Interest: Engineering, design, construction and/or project management of laboratories and other installations.

Major Activity of Company: Feasibility studies and reports; appraisals; consulting engineering; design and construction — 100%.

Recruiting Contact: G. S. Currie, Development Manager.

THOMSON RESEARCH ASSOCIATES LIMITED

53 Shaw Street, Toronto 3, Ontario.

President: John R. Woods.

Fields of Interest: Textiles, particularly wool and cotton research as well as finishing of all fibres. Germicides, as applied to textiles, leather, plastics, paint. Testing, road building materials (asphalt, concrete); textiles, all phases.

Major Activity of Company: Mfg. 15%, R&D 50%, T&E 25%, Consulting 10%.

INDUSTRIAL RESEARCH FACILITIES

Research Facilities: 53 Shaw Street, Toronto, Ontario. 70 Crawford Street, Toronto, Ontario.

Research Personnel: Mr. N. H. Cruickshank, M.Sc., Vice-President and General Manager. Mr. P. J. Radford, B.Sc., Chief Chemist. Mr. F. Mains, B.Sc., B.A.Sc., Research Scientist. Mr. G. McLeod, B.A.Sc., Research Scientist. Miss Nancy Zid, B.Sc., Research Assistant.

Laboratory Staff: Technicians 4.

Recruiting Contact: N. H. Cruickshank.

TMC (CANADA) LIMITED R.R. # 5, Ottawa, Ontario.

President: D. V. Carroll.

Fields of Interest: Research and development of radio transmitting and receiving and auxiliary equipments in the ELF through H/F spectrum. Specializing in single sideband and antenna multicoupler fields also in specialized communication fields.

Major Activity of Company: Mfg. 65%, R&D 15%, T&E 10%, Consulting 10%.

Research Facilities: 8,000 sq. ft. in modern plant on 8 acres of property. Screened room environmental chambers and complete instrumentation for communications R&D. Modern metal shop.

Research Personnel: D. V. Carroll, President. J. C. Adair, Vice-President. K. Holt, Technical Director. A. M. Sadik, Engineer.

Laboratory Staff: Engineers 2, technicians 4, and supporting draughting and library facilities.

Recruiting Contact: D. V. Carroll, President.

UNION CARBIDE CANADA LIMITED 123 Eglinton Avenue East, Toronto 12, Ontario.

President: Mr. J. S. Dewar.

Fields of Interest: Manufacture of chemicals and resins.

Major Activity of Company: Mfg. 100%.

Research Personnel: G. L. Bata, Director of Development. J. W. Donaghy, Technology Manager, Chemicals. H. R. Larsen, Technology Manager, Thermoplastics. R. S. Zalkowitz, Technology Manager, Thermo-setting

INDUSTRIAL RESEARCH FACILITIES

Products. J. E. Hazell, Senior Research Scientist, Physical Chemistry and Processes. K. P. Singh, Senior Research Scientist, Organic Chemistry.

Laboratory Staff: Technicians 18, development assistants 5, technical specialists 3, group leaders 4, development engineers and chemists 18, research scientists 2.

Recruiting Contact: Mr. J. B. Ward.

UNIROYAL LIMITED

P.O. Box 130, Place d'Armes, Montreal, P.Q.

President: E. A. Martin.

Fields of Interest: Exploratory and applied organic, physical and polymer chemistry and technology of products and processes related to monomers, resins, elastomers, textiles, rubber and industrial chemicals, agricultural chemicals.

Major Activity of Company: Mfg. 95%, R&D and other 5%.

Research Facilities: Central research laboratories in Guelph, with associated divisional development laboratories, pilot plants, etc., in Kitchener (tires, rubber and textile products, crash pads, coated fabrics) and in Elmira (chemicals, resins).

Research Personnel: Professionals (research chemists, physicists, engineers) 55, supporting technicians and laboratory staff in central research laboratories, Guelph, 35.

Laboratory Staff: Professional (engineers, chemists) 35, supporting technicians and laboratory staff in divisional development laboratories in Kitchener and Elmira, 45.

Recruiting Contact: J. C. R. Warren, Co-ordinator, Research and Development.

VARIAN ASSOCIATES OF CANADA LIMITED

45 River Drive, Georgetown, Ontario.

President: Mr. B. H. Breckenridge.

Fields of Interest: Development of reflex klystrons, travelling wave tubes,

INDUSTRIAL RESEARCH FACILITIES

millimeter klystrons and extended interaction oscillators. Development of long life, high current density thermionic emitters.

Major Activity of Company: Mfg. 80%, R&D 20%.

Research Facilities: Complete range of facilities required for the design, manufacture and testing of small microwave tubes. Chemistry and metallurgical laboratory.

Research Personnel: M. Viant, (millimeter devices). K. A. Macdonald, (thermionic emission). C. Searle, (travelling wave tubes). K. Beecker, (waveguide components). T. Smith, (reflex klystrons).

Laboratory Staff: Electrical engineers 6, physical chemist 1, technicians 8.

Recruiting Contact: Mr. R. B. Wilson.

WARNER-LAMBERT CANADA LIMITED

2200 Eglinton Avenue East, Scarborough, Ontario.

President: D. M. McCaskill.

Fields of Interest: Research on medium and long term toxicity of new drugs and in Basic Sciences, mainly cell biology and experimental pathology.

Major Activity of Company: R&D 100%.

Research Facilities: Warner-Lambert Research Institute of Canada, Limited, Sheridan Park, Ontario. 30,000 square feet of laboratories and animals quarters with completely equipped facilities for toxicity testing and basic research.

Research Personnel: Dr. George Lumb, Vice-President, Director. Dr. Andrew Diosy, Clinical Research Director. Dr. F. A. de la Iglesia, Toxicology Director. Mr. J. R. Stokes, Senior Scientist and Business Manager. Dr. J. C. Sosa-Lucero, Biochemist Scientist.

Laboratory Staff: Technologists 20, pathologist 1, veterinarian 1, other staff 19.

Recruiting Contact: Dr. George Lumb, Vice-President, Director.

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